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PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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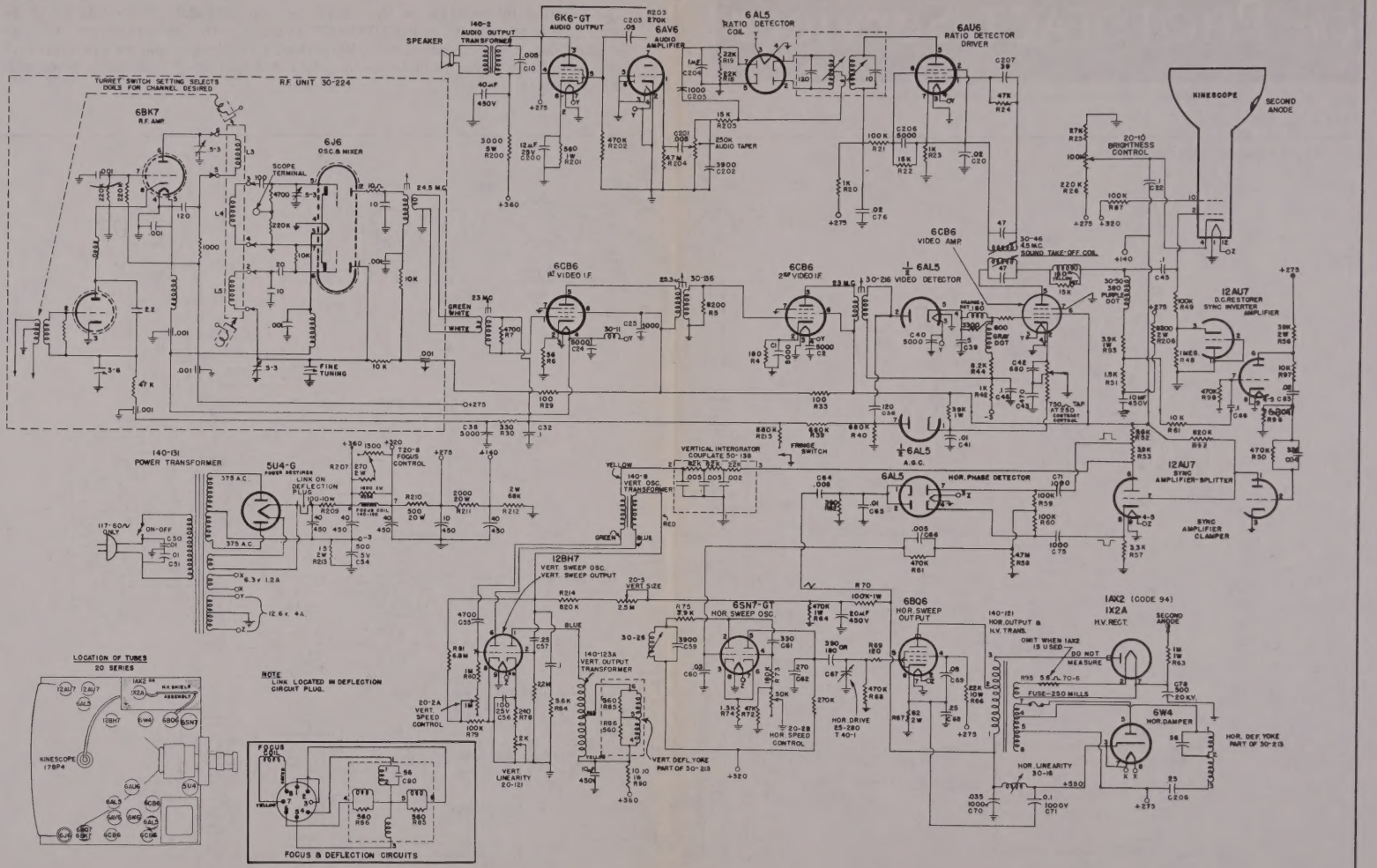


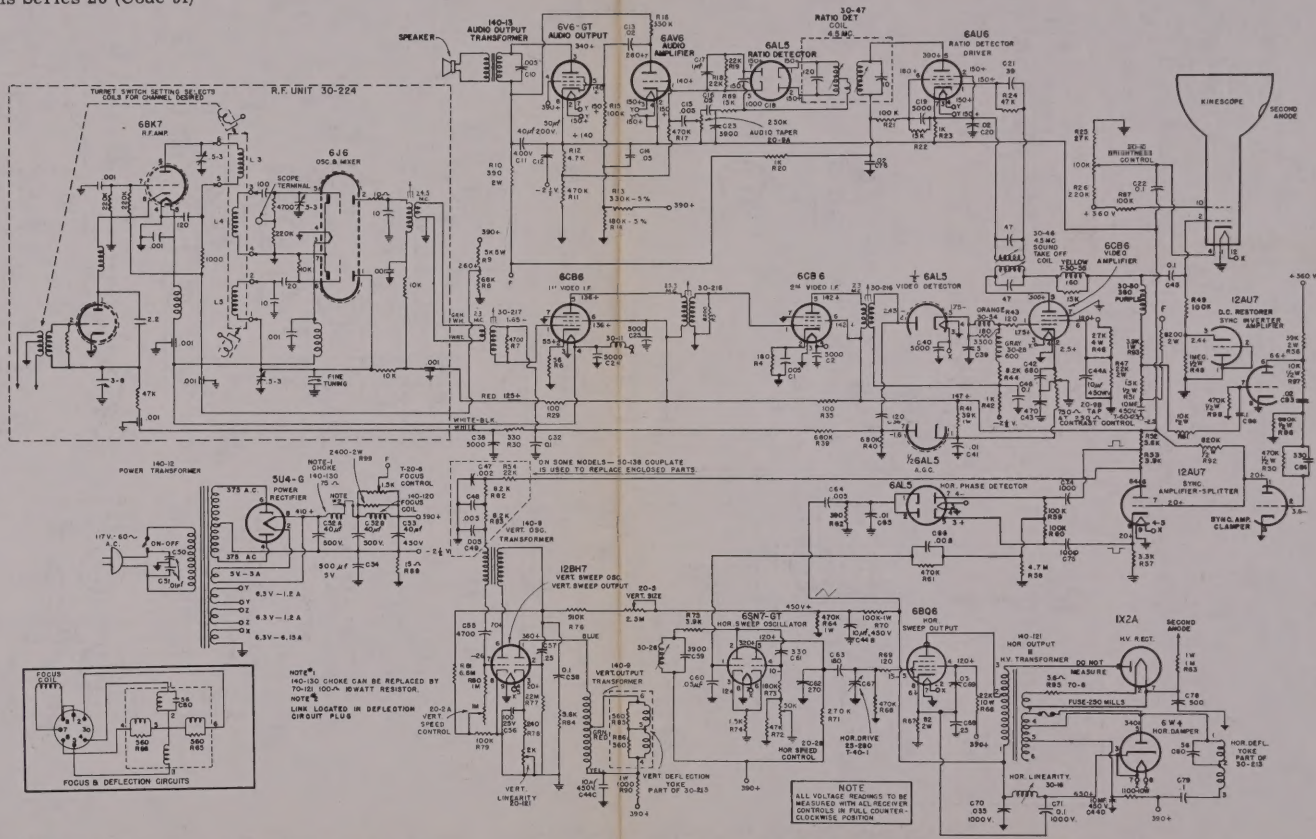
Schematic Diagram Courtesy of Regal Electronics Corp.

The PHOTOFACT Servicer

Vol. 33 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Sept. 1, 1956
Sets 327, 328

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

Regal Chassis Series 20 (Code 91)



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Schematic Diagram Courtesy of Regal Electronics Corp.

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MOTOROLA MODELS Y21C4B, Y21K41, B, Y21K42, B, Y21K43, B, Y21K44B, W, Y21K45, Y21K51BA, MA, Y24K10, B, Y24K11, B, Y24T4, B, 21C4, B, 21K41, B, R, 21K42, B, 21K43, B, 21K44B, W, 21K45, 21K51BA, MA, 24K10, B, 24K11, B, 24T4, B (Ch. TS-533, Y)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 316

	Motorola models Y21C4, B, Y21K41, B, Y21K42, B, Y21K43, B, Y21K44B, W, Y21K45, Y24K10, B, Y24K11, B, Y24T4, B, 21C4, B, 21K41, B, R, 21K42, B, 21K43, B, 21K44B, W, 21K45, 24K10, B, 24K11, B and 24T4, B (Ch. TS-533, Y) were covered in Photofact Folder 10 – Set 316. Models Y21K51BA, MA and 21K51BA, MA are added, along with late production changes, with the publication of this bulletin.
Ch. TS-533A-01	TO IMPROVE CONTRAST R48 is added from the center arm of the contrast control (R1A) to ground.
Ch. TS-533A-02	TO CORRECT VERTICAL LINE STRUCTURE A shielded lead is added from the horizontal hold control (R5) to R97 and is dressed away from the 1st. video IF stage.
Ch. TS-533A-03	COMPONENT CHANGE L40 is removed and C103 is connected directly to pin 6 of T5.
Ch. TS-533B-00	TO REDUCE ADJACENT CHANNEL INTERFERENCE A 47.25MC trap is added. See Fig. 1 for partial schematic showing the revised circuit. TO IMPROVE VIDEO IF ALIGNMENT The first video IF stage is revised to improve alignment. A partial schematic is given in Fig. 1 showing the revised circuit. With this change the tuners change to part #VTT-79C and VTT-80C.
Ch. TS-533B-01	COMPONENT CHANGE C103 and C104 are increased from 100MMF to 150MMF.
Ch. TS-533B-02	TO INCREASE AUDIO SENSITIVITY R59 is omitted.
Ch. TS-533B-03	TO PREVENT CAPACITOR BREAKDOWN The negative sides of C5 and C6 are removed from R6 (vertical linearity control) and reconnected to the 260V line. A 20MFD, 450V electrolytic capacitor (part #23K710667) is added. The negative side connects to the high side of the vertical linearity control and the positive side connects to the 260V line.
Ch. TS-533B-04	TO ELIMINATE PARASITIC OSCILLATIONS A 100Ω resistor is added from pin 3 of V12 to the blue lead of T6.
Ch. TS-533B-05	TO REDUCE SLIPPAGE To reduce slippage on UHF sets tension is applied to drive belt by adding a roller and spring assembly (part #1V735489).

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Ch. TS-533B-06	TO IMPROVE CONTRAST The video output circuit has been revised to reduce white limiting at maximum contrast with a weak signal. A partial schematic is given in Fig. 2 showing the revised circuit.
Ch. TS-533B-07	COMPONENT CHANGE The 470Ω resistor connecting from the center arm of the contrast control to ground (added in change B-06) is decreased from 470Ω to 220Ω.
Ch. TS-533B-08	TO ELIMINATE SYNC COMPRESSION The AGC circuit has been revised to eliminate sync compression and to improve the video portion of the picture. A partial schematic is given in Fig. 3 showing the new circuit.
Ch. TS-533B-09	TO REDUCE FILAMENT VOLTAGE ON 1B3 R109 is increased from 3.3Ω to 4.7Ω.
Ch. TS-533B-10	UHF TUNER REVISED The UHF tuner is changed to part #QTT-37B.
Ch. TS-533B-11	COMPONENT CHANGE R29 and R33 are increased from 8.2KΩ, 2 watts to 10KΩ, 4 watts.
Ch. TS-533B-12, TS-533B-13	TEST POINT ADDED C74 is changed to a feed-thru capacitor to provide an external test point for audio alignment.
Ch. TS-533B-14	TO IMPROVE PICTURE QUALITY C39 is increased from 2.2MMF to 2.7MMF.
Ch. TS-533C-00	TO REDUCE HUM A 470Ω resistor is added from the junction of C5 and the 20MFD electrolytic capacitor added in change "B-03" to the 260V line.
	TO ELIMINATE HORIZONTAL PULL C91 and C92 are changed to 10%.
Ch. TS-533C-01	TO REDUCE THE EFFECT OF PICTURE TUBE CATHODE TO GRID LEAKAGE R52 is decreased from 2.2Meg to 470KΩ. C60 is increased from a .05MFD to a .1MFD. POWER TRANSFORMER CHANGED The power transformer (T1) is changed to part #25C738251. This transformer is not interchangeable with 25C737472 only because of mounting.
Ch. TS-533C-03	TO PROTECT CRYSTAL (M3) A 68KΩ resistor and a .005MFD capacitor are wired in parallel and connected from pin 2 of V6 to the junction of L28 and L29. R42 remains connected to pin 2 of V6. Some chassis incorporating this change were coded "C-00-1".
Ch. TS-533C-04	COMPONENT CHANGE The voltage rating of C94 is increased from 1000V to 2000V. Some chassis incorporating this change were coded "C-03-1". C3A is decreased from 30MFD, 200V to 10MFD, 400V.
Ch. TS-533C-05	TO PREVENT PICTURE TUBE DAMAGE To limit current flow in event of picture tube internal arc-over a 33KΩ resistor is added from pin 10 of V20 to boost (540V). Some chassis may use 39KΩ or 100KΩ, however, 33KΩ is the recommended replacement.
Ch. TS-533YH	COMPONENT CHANGE The UHF tuner voltage dropping resistor is increased from 2700Ω to 3900Ω. UHF tuner is changed to part #VTT-81. VHF tuner is changed to part #PTT-80. The PTT-80 is the same as the VTT-80, except for UHF tuner mounting bracekts and UHF belt drive pulley.

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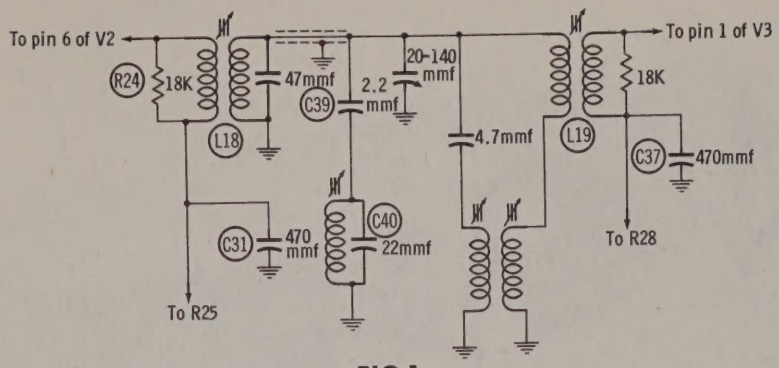


FIG 1

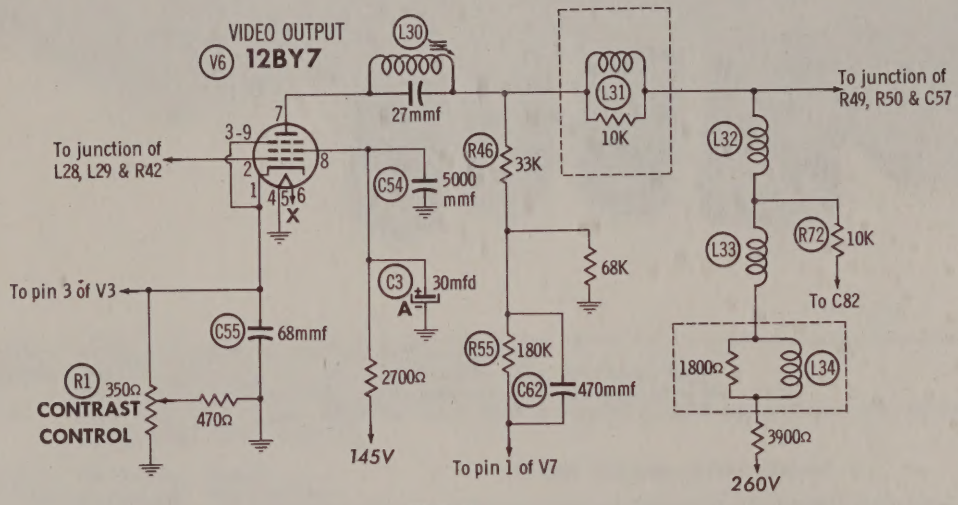


FIG 2

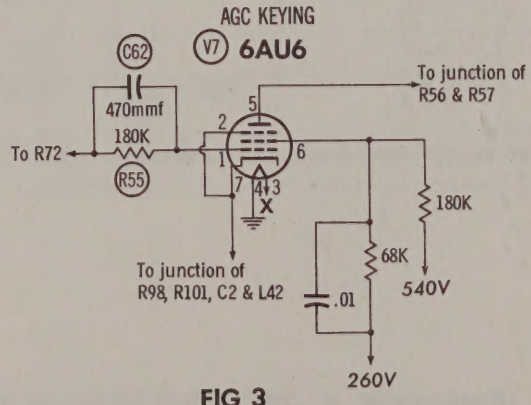
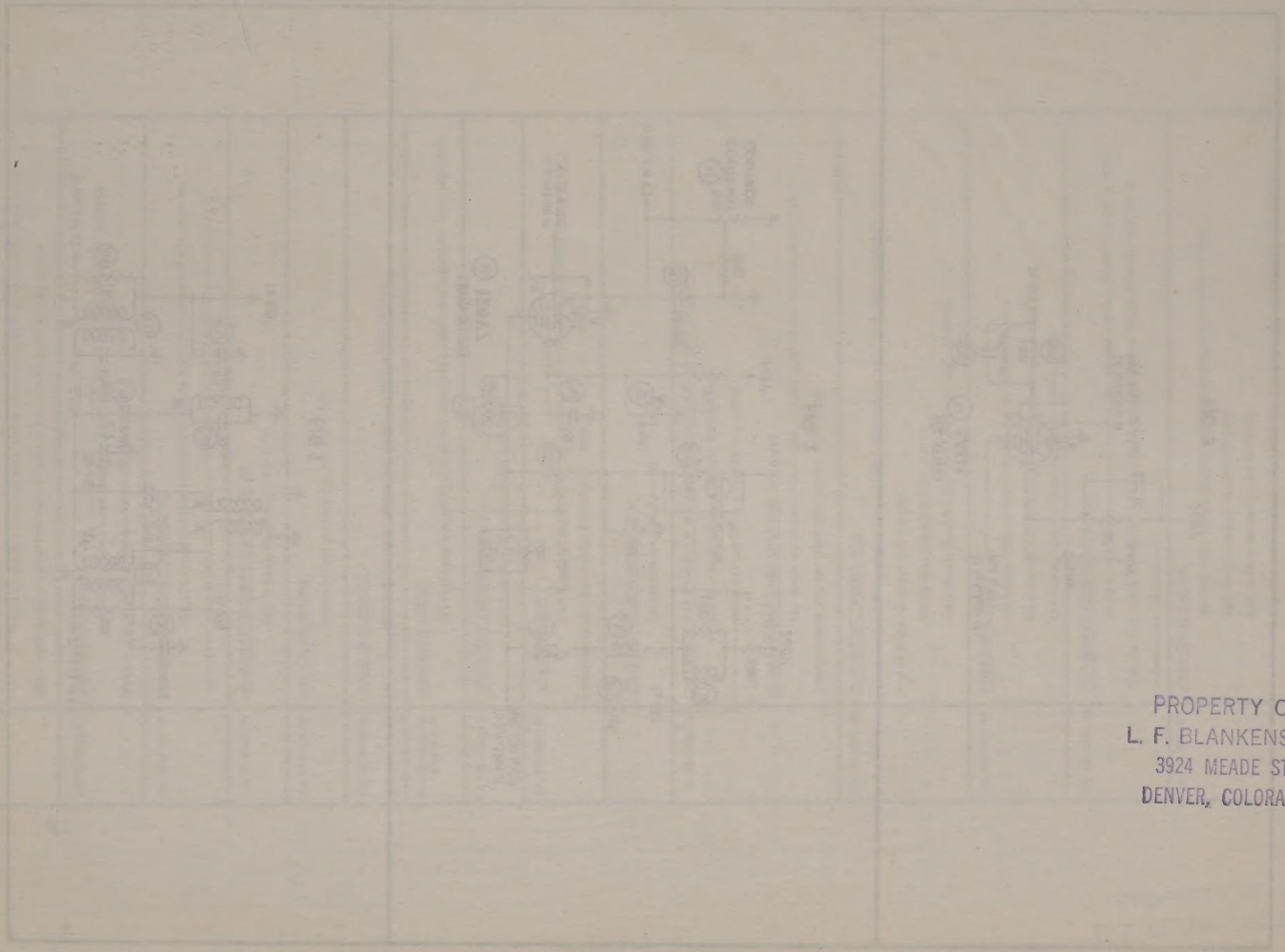


FIG 3



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AUTOMATIC
MODEL F-241

TRADE NAME	Automatic Model F-241 (For 1954 Ford Automobiles)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Six)	Types 6BA6 RF Amplifier, 6BE6 Converter, 6BA6 IF Amplifier, 6AV6 (or) 6AT6 Det.-AVC-AF Amp,, 6V6GT Output, 6X5GT Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.4 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538KC-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	1610KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1610KC	"	"	A5	"
3.	68MMF	Antenna lead.	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	With receiver installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum volume.						

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BA6	
V2	Converter	6BE6	
V3	IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V4	Det. -AVC-AF Amplifier	6AV6	Note 1
V5	Output	6V6GT	
V6	Rectifier	6X5GT	

Note 1. 6AT6 may be used as an alternate.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	CE-86	AFH3-107	C080	FP345.8	TMT-92	T-470	TVL-3632
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		CC101	NP0-D1100	TCN-100	N042	N750L-101	NT-531	5TCC-T1	
C3	5000		C502-4	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C4	.047	200	C503-2	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C5	.047	200	C503-2	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C6	5		CC50	SI5	D6-050	G011	GP1K-050	ZT-555	5GA-V5	
C7	40		CC400	SI39	D6-400	TP28	GP1K-390	UC-545	5GA-Q39	
C8A	220									
B	5000									
C	5000		♦PC-151	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦DT-2	
D	250									
E										
C9	5000		C502-2	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C10	.01	600	C103-6	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C11	.007	1600	C702-16	DAC-24	DD16-702	CUB16D7		PT1627	MD-D7	Note 1
C12	.5	100	C504-1	P185N-1		MP2P5		RF480	68P20	
C13	.5	100	C504-1	P185N-1		MP2P5		RF480	68P20	

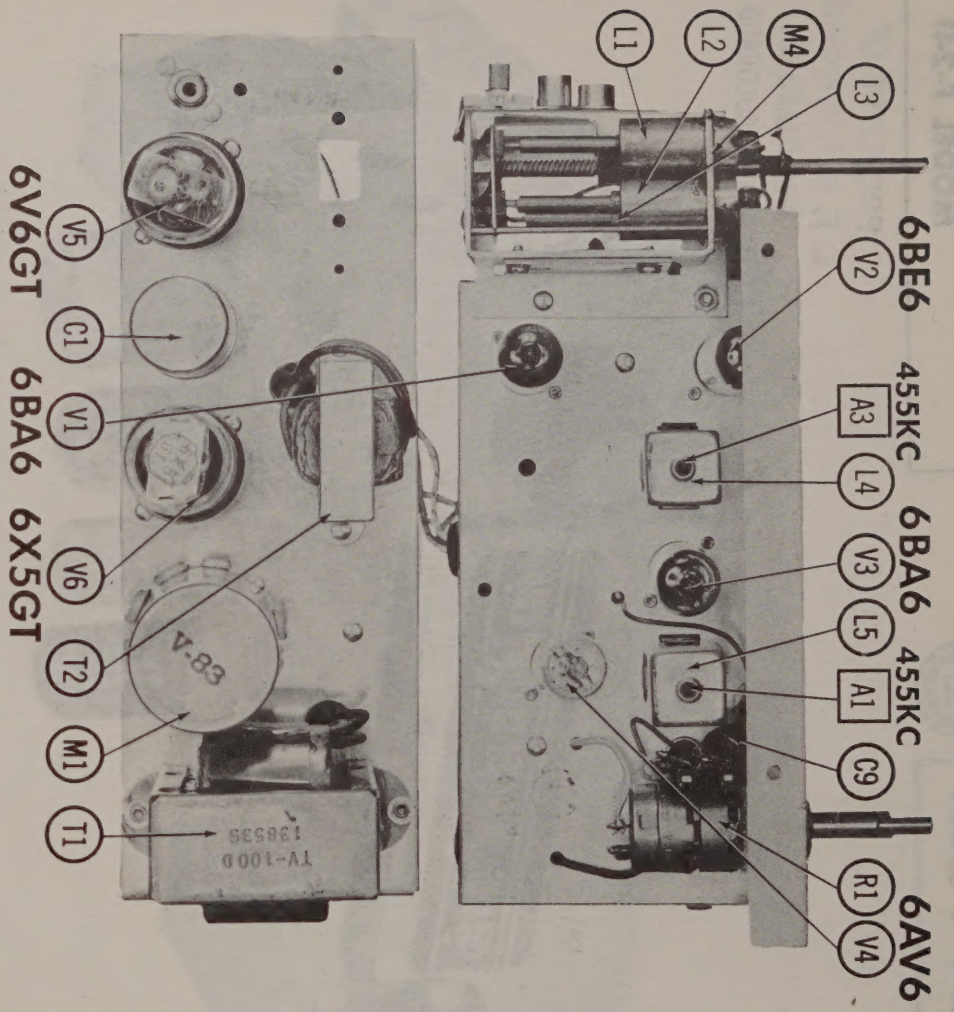
Note 1. Some versions use .008MFD in this application (part #C802-16).
♦ Items C8A, C8B, C8C, C8D, C8E, R10A, R10B and R10C are combined in one unit. When replacing items separately, C8D and C8E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	RV-236	F1-68	RTV-554C	*QJ-689A	UF26A	Tone (Panel)
B	250K	½		R2-41			UR55A	Volume (Rear)-Note 1
C	Bushing			AK-27	XB-1		EB214	Attach to R1A
D	Switch			KB-4			US-26	Attach to R1B

Note 1. In some versions R1B may be 500KΩ.
* Concentrikit Equivalent: K-8 Kit, Base Elements & Shafts: B13-139 & P14-121 (Panel)
B13-132 & R1-202 (Rear)
S25 Bushing
76-1 Switch

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AUTOMATIC PART No.	IRC PART No.	
R2	470K		R474	BTS-470K	
R3	220Ω		R221	BTS-220	
R4	220Ω		R221	BTS-220	Note 1
R5	150K		R154	BTS-150K	
R6	47K		R473	BTS-47K	
R7	6800Ω	2	R682-2	BTS-6800	
R8	1000Ω		R102	BTS-1000	
R9	2.2Meg		R225	BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AUTOMATIC PART No.	IRC PART No.	
R10A	6.8Meg			BTS-6.8Meg	
B	470K		*PC-151	BTS-470K	
C	470K			BTS-470K	
R11	330Ω		R331	BTS-330	
R12	1000Ω	1	R102-1	BTA-1000	
R13	68Ω			BTS-68	Note 2
R14	68Ω			BTS-68	Note 2

* Items R10A, R10B, R10C, C8A, C8B, C8C, C8D, C8E are combined in one unit.
Note 1. Not used in some versions.
Note 2. Some versions use 82Ω in this application (Mfgr. part #R820).

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	AUTOMATIC PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6VDC @2.2A	480VCT .048A			TV-100D	V3801	P2970	P6476 ①		V-36X ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC	AUTOMATIC PART No	Halldorson PART No	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No.	
T2	5.2KΩ	3-4Ω	TO-4502-A	Z1003	A-2930	A-3850	24S51	S-5X ①	① Drill one new mounting hole.

SPEAKER

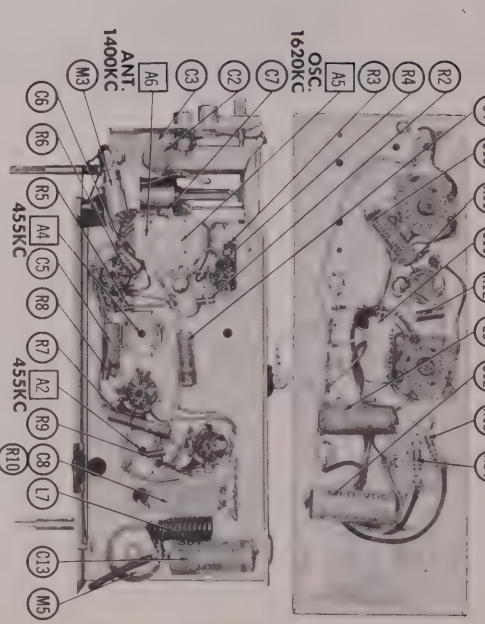
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	RCA TYPE No	
SP1	6" x 9"	PM	3-4Ω	PM-902	69A2	23S81	① Used as alternate
	6" x 9"	PM	3-4Ω	PM-901 ①	69A2	23S81	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AUTOMATIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12.5Ω						Note 1
L2	RF Coil	12.5Ω						Note 1
L3	Osc. Coil	.5Ω	2.5Ω					Note 1
L4	Input IF	13Ω	13Ω	1655-16	16-6758	BC-352	12-C1	
L5	Output IF	13Ω	13Ω	1656-16	16-6758	BC-353	12-C2	
L6	Vib. Hash Choke	0Ω		L302A				17 Microhenries
L7	Fil. Choke	0Ω		L303				1.3 Microhenries

Note 1. Part of complete assembly (M4), Mfgr's. part #PT-500D.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

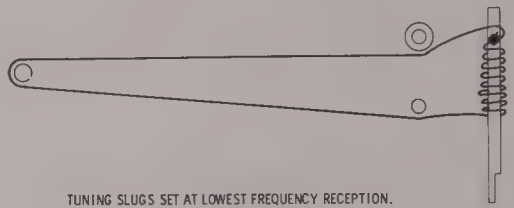
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6VDC	115∿	V-83	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3FE	14A	A300		307014. (3FE 14A)	156014	3FE14	HR1

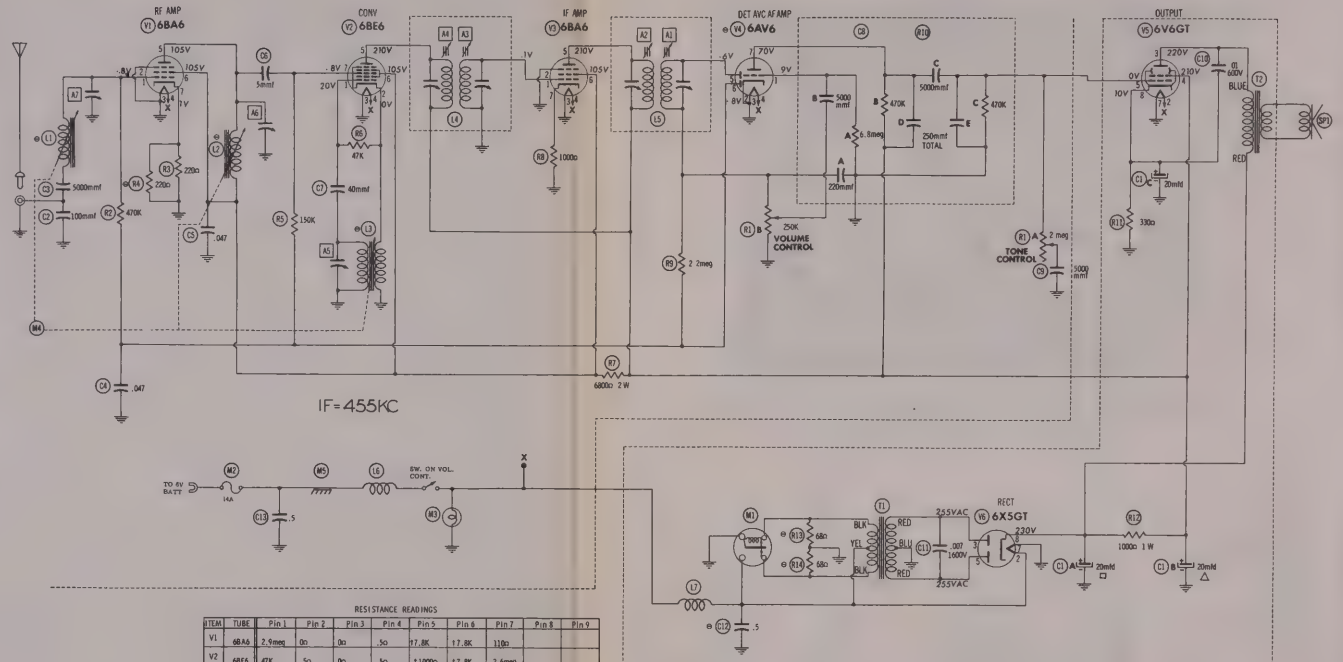
MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M3	Dial Light	T47	#47
M4	Tuner	PT-500D	Permeability, includes L1, L2, L3
M5	Spark Plate	X215	
A5	Trimmer Cap.	CT-3	Osc.
A6	Trimmer Cap.	CT-2	[illegible]
A7	Trimmer Cap.	CT-1	Ant.
	Knob	H710	Volume
	Knob	H910	Tuning
	Knob	H831	Tone
	Dial Scale	D241	
	Dial Pointer	PS241	



TUNING SLUGS SET AT LOWEST FREQUENCY RECEPTION.

DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	2.9meg	0Ω	0Ω	.5Ω	†7.8K	†7.8K	110Ω		
V2	6BE6	47K	.5Ω	0Ω	.5Ω	†1000Ω	†7.8K	2.6meg		
V3	6BA6	15Ω	0Ω	0Ω	.5Ω	†1000Ω	†7.8K	1080Ω		
V4	6AV6	6.8meg	0Ω	0Ω	.5Ω	250K	2.4meg	†470K		
V5	6V6GT	NC	.5Ω	†400Ω	†1000Ω	470K	NC	0Ω	330Ω	
V6	6X5GT	NC	.5Ω	400Ω	NC	400Ω	NC	0Ω	20K	

† MEASURED FROM PIN 8 OF V6.
NC - NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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CAPEHART MODEL 31T216M-5 (Ch. CXC-13)

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MODEL 31T216M-5

CAPEHART MODEL
31T216M-5 (Ch. CXC-13)

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CAPEHART MODEL
31T216M-5 (Ch. CXC-13)

TRADE NAME	Capehart Model 31T216M-5 (Ch. CXC-13)
MANUFACTURER	Capehart-Farnsworth Co., Fort Wayne, Ind.
TYPE SET	Color Television Receiver
TUBES	Thirty
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 3.1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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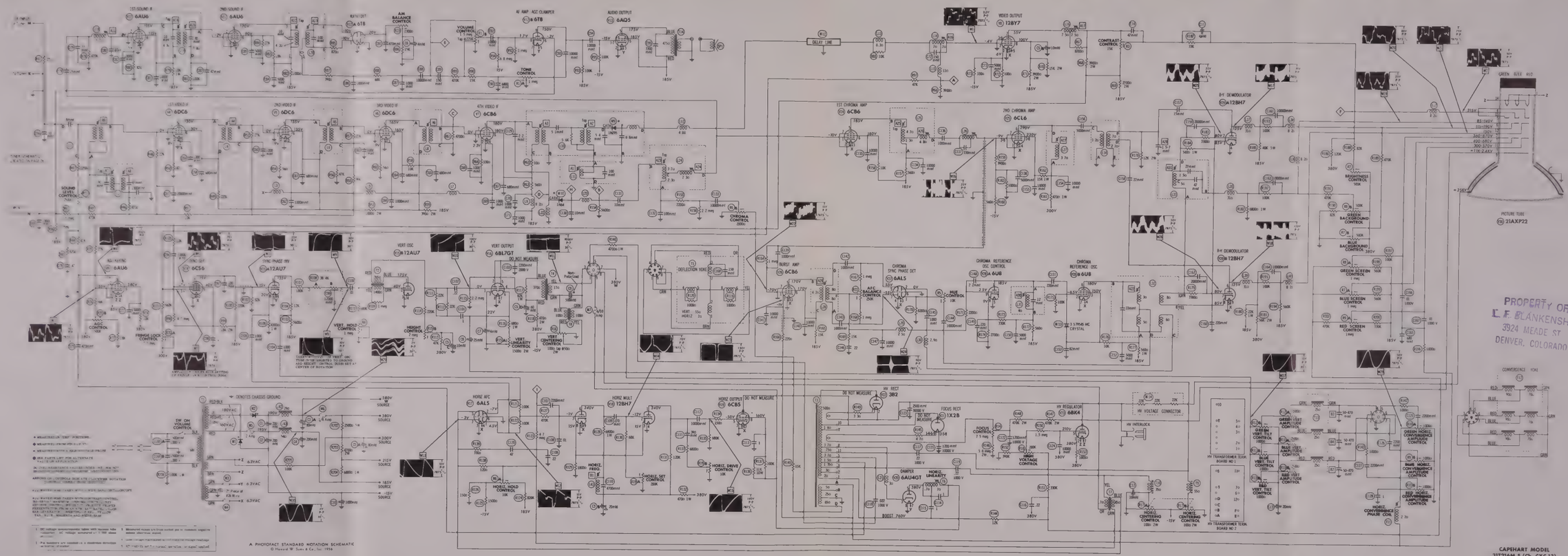
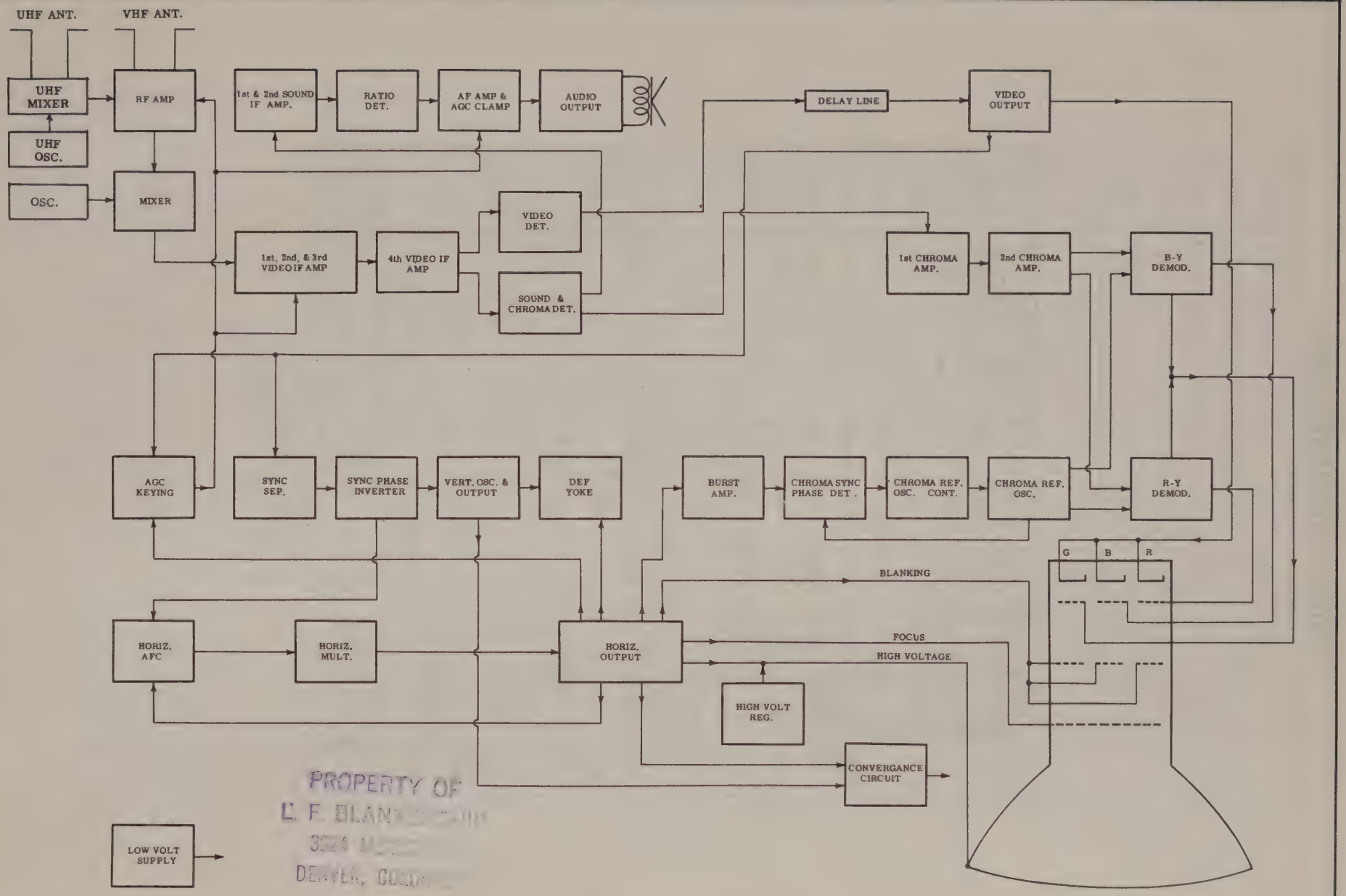


CAPEHART MODEL
317216M-5 (Ch. CXC-13)



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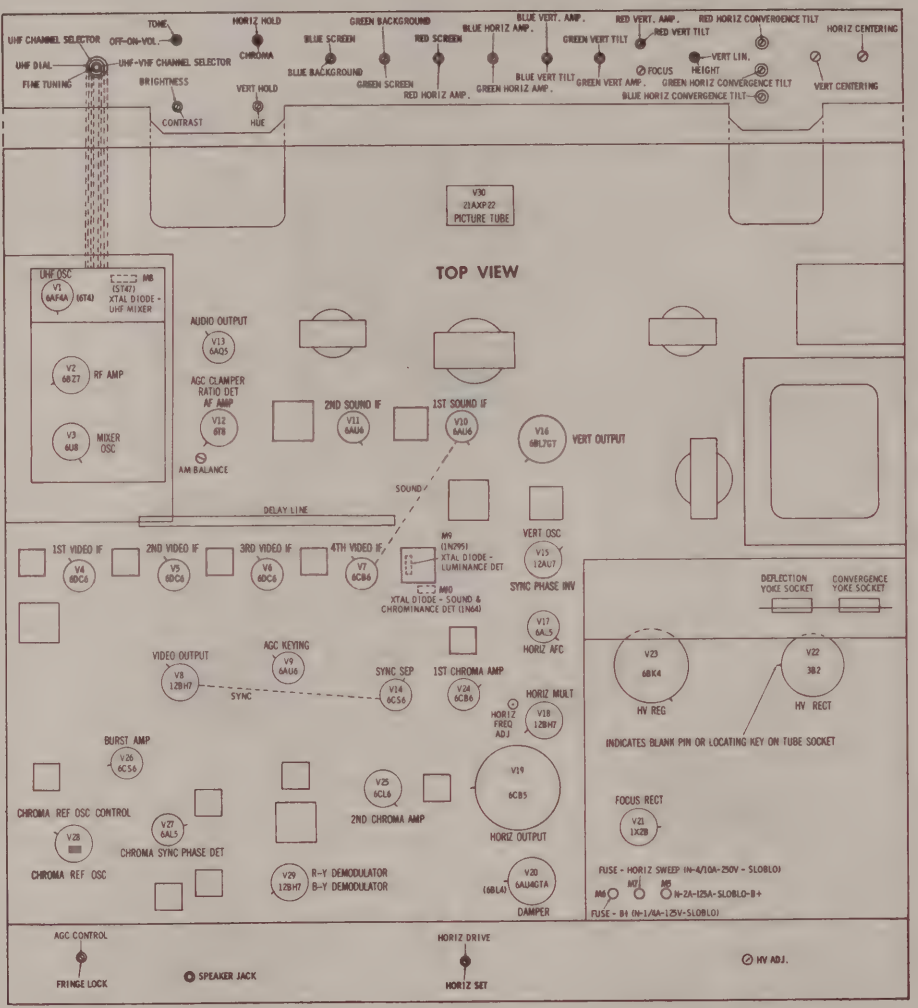
BLOCK DIAGRAM

CAPEHART MODEL 3121 6M-5 (Ch. CXC-13)

TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	*ǂ 9KΩ	6.8KΩ	.1Ω	0Ω	0Ω	6.8KΩ	*ǂ 9KΩ		
V2	6BZ7	† 7.2KΩ	400KΩ	INF	.1Ω	0Ω	INF	1.5Meg	0Ω	0Ω
V3	6U8	ǂ 8KΩ	100KΩ	ǂ 40KΩ	.1Ω	0Ω	ǂ 5KΩ	0Ω	0Ω	15KΩ
V4	6DC6	90KΩ	47Ω	.1Ω	0Ω	ǂ 1.6KΩ	ǂ 1.6KΩ	0Ω		
V5	6DC6	80KΩ	56Ω	.1Ω	0Ω	ǂ 1.4KΩ	ǂ 1.4KΩ	0Ω		
V6	6DC6	47KΩ	56Ω	.1Ω	0Ω	ǂ 450Ω	ǂ 10KΩ	0Ω		
V7	6CB6	.1Ω	330Ω	0Ω	.1Ω	ǂ 600Ω	ǂ 600Ω	0Ω		
V8	12BY7	80Ω	3.9KΩ	0Ω	.1Ω	.1Ω	0Ω	ǂ 5.5KΩ	† 3.9KΩ	0Ω
V9	6AU6	ǂ 22KΩ	ǂ 54Ω	† 100KΩ	† 100KΩ	550KΩ	† 10KΩ	ǂ 54Ω		
V10	6AU6	470KΩ	0Ω	.1Ω	0Ω	ǂ 10KΩ	ǂ 10KΩ	82Ω		
V11	6AU6	100KΩ	0Ω	.1Ω	0Ω	ǂ 1KΩ	ǂ 12KΩ	0Ω		
V12	6T8	INF	15KΩ	INF	0Ω	.1Ω	1.5Meg	0Ω	850KΩ	ǂ 100KΩ
V13	6AQ5	100KΩ	0Ω	.1Ω	0Ω	ǂ 530Ω	ǂ 54Ω	100KΩ		
V14	6CS6	50KΩ	0Ω	.1Ω	0Ω	ǂ 60KΩ	ǂ 18KΩ	4.7Meg		
V15	12AU7	† 750KΩ	1.2Meg	0Ω	0Ω	0Ω	ǂ 18KΩ	50KΩ	4.3KΩ	.1Ω
V16	6BL7GT	2.2Meg	† 830Ω	600Ω	2.2Meg	† 830Ω	600Ω	.1Ω	0Ω	
V17	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	4.4KΩ	0Ω	4.4KΩ		
V18	12BH7	† 120KΩ	160KΩ	1.8KΩ	0Ω	0Ω	† 7KΩ	5Meg	1.8KΩ	.1Ω
V19	6CB5	NC	0Ω	0Ω	NC	680KΩ	NC	.1Ω	† 9.5KΩ	TOP CAP ¶ 8.3Ω
V20	6AU4GT	NC	NC	330KΩ	NC	† 29Ω	NC	.1Ω	0Ω	
V21	1X2B	15Meg	15Meg	INF	15Meg	15Meg	15Meg	INF	15Meg	15Meg TOP CAP ¶ 8.3Ω
V22	3B2		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ¶ 510Ω
V23	6BK4	† 1KΩ	† 100KΩ	NC	NC	¶ 1.8Meg	NC	† 100KΩ	NC	TOP CAP INF
V24	6CB6	2.2Meg	0Ω	.1Ω	0Ω	ǂ 600Ω	ǂ 10KΩ	0Ω		
V25	6CL6	0Ω	4KΩ	† 18KΩ	.1Ω	0Ω	† 3KΩ	0Ω	† 18KΩ	4KΩ
V26	6CB6	1Meg	220Ω	.1Ω	0Ω	ǂ 15KΩ	ǂ 15KΩ	0Ω		
V27	6AL5	8.2KΩ	8.2KΩ	.1Ω	0Ω	INF	0Ω	INF		
V28	6U8	ǂ 600Ω	100KΩ	ǂ 10KΩ	.1Ω	0Ω	ǂ 600Ω	0Ω	2.7KΩ	INF
V29	12BH7	ǂ 40KΩ	10KΩ	6.8KΩ	0Ω	0Ω	ǂ 16KΩ	10KΩ	6.8KΩ	.1Ω
V30	21AXP22	† 100KΩ	ǂ 80KΩ	¶ 350-550KΩ	† 30KΩ	† 30KΩ	† 90KΩ	¶ 100-550KΩ	PIN 9 10Meg	PIN 11 ¶ 12KΩ-450KΩ
		PIN 12 † 90KΩ	PIN 13 † 30KΩ	PIN 14 † 100KΩ						

* MEASURED IN "UHF" POSITION.
† MEASURED FROM POSITIVE SIDE OF C1.
¶ MEASURED FROM PIN 3 OF V20.
ǂ MEASURED FROM POSITIVE SIDE OF C2.

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CAPEHART MODEL
31T216M-5 (Ch. CXC-13)

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the .4 amp. fuse located in the high voltage cage. Remove the AGC amplifier tube (V9) from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply to the ungrounded side of C57. Connect the positive lead to chassis. Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point Ⓒ. Low side to chassis.	44.0MC (10MC Swp)	41.25MC	Any	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A1	Adjust to place 41.25MC marker in trap notch as in Fig. 1.
2.	"	"	"	42.75MC 45.75MC	"	"	A2, A3	Adjust for response curve similar to Fig. 1 with markers properly located.
3.	"	"	"	41.25MC 41.65MC 42.75MC 45.75MC	"	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.		Check for response curve similar to Fig. 2. If necessary, make SLIGHT compromise adjustment of A2 and A3 to obtain desired response. Repeat step 1.
4.	"	High side to pin 1 (grid) of 1st. video IF amplifier (V4). Low side to chassis.	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A4, A5, A6	Adjust for response curve similar to Fig. 3. Adjust A4 to form high frequency side of curve and to position 45.75MC marker. Adjust A5 to form the low frequency side of the curve. A6 is adjusted to correct the response curve tilt.
5.	"	"	"	41.65MC	"	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.		Retouch A5 to place 41.65MC marker in correct position as shown in Fig. 4.
6.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Retouch A4 and A6 if necessary to obtain response curve similar to Fig. 3. DO NOT readjust A5 or step 5 will have to be repeated.
7.	Direct	High side to tube shield floating over converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 47.25MC	9	High side thru 10KΩ to point Ⓐ. Low side to chassis.	A7, A8	Preset R21 to mid-range position. Adjust to place markers in trap notches as in Fig. 3.
8.	"	"	"	41.65MC 45.75MC	"	"	A9, A10	Adjust for maximum amplitude and response as in Fig. 3. Repeat step 7. Adjust sound trap adjustment (R21) for maximum trapping action of 41.25MC.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to point Ⓓ. Low side to chassis.	Not used	4.5MC (30% 400~ AM Mod.)	Any	Vert. Amp. thru detector probe (Fig. 5) to pin 5 (plate) of V24. Low side to chassis.	A11	Adjust for MINIMUM indication on scope.
10.	"	High side to pin 1 (grid) of 2nd. sound IF tube (V11). Low side to chassis.	4.5MC (25KC Swp)	4.5MC	"	Vert. Amp. to point Ⓔ. Low side to chassis.	A12, A13	Adjust for maximum amplitude and symmetry of "S" curve as in Fig. 6.
11.	"	High side to point Ⓓ. Low side to chassis.	4.5MC (25KC Swp)	4.5MC	"	"	A14, A15	Reduce sweep generator output below the limiting level of the 2nd. sound IF coil (L19) indicated by sharp tuning action of A14. Adjust A14 and A15 for maximum amplitude of the "S" curve. Increase sweep generator output and repeat step 10.
12.	"	"	Not used	4.5MC (30% 400~ AM Mod.)	"	"	R23	Adjust for MINIMUM AM modulation shown on scope.

VIDEO AMPLIFIER ALIGNMENT

Disconnect L12 from terminal "D" of L10.
Disconnect R73 from pin 1 of the video amplifier (V8).
Disconnnect the grounded side of R72 and connect the positive lead of a 3 volt battery to the loose end of R72. Connect the positive lead of the battery to ground.
Connect a 22KΩ resistor from point Ⓕ to chassis. Remove the picture tube socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	3300Ω Carbon Resistor	High side to loose end of L12. Low side to chassis.	2MC (4MC Swp)	3.1MC 3.58MC	Any	Vert. Amp. thru low capacity probe to point Ⓕ. Low side to chassis.	A16, A17	Adjust A16 to place 3.58MC marker at zero as in Fig. 7. Adjust A17 for maximum gain and response as in Fig. 6. Reconnect L12, R73 and R72. Remove 22KΩ resistor from point Ⓕ to chassis.

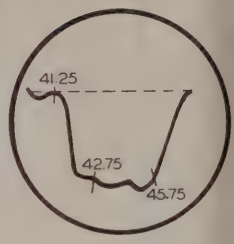


FIG. 1

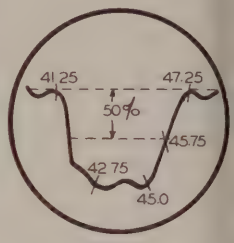


FIG. 3

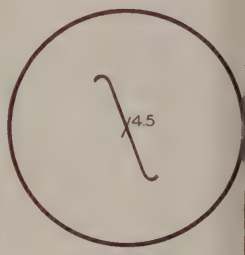


FIG. 6

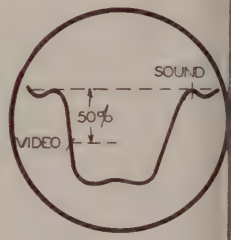


FIG. 8

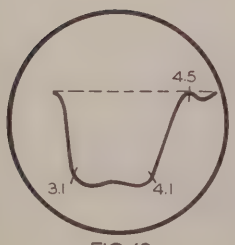


FIG. 10

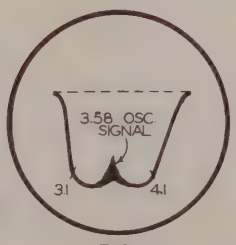


FIG. 11

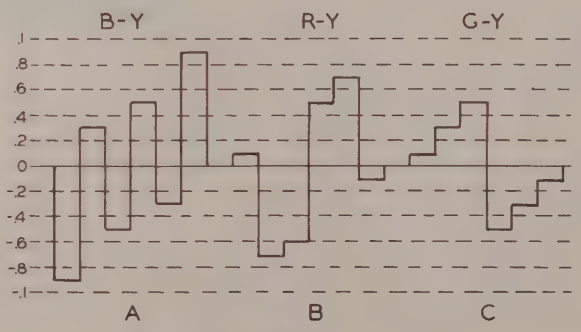


FIG. 12

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the .4 amp. fuse located in the high voltage cage.
Remove the AGC amplifier tube (V9) from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply to the ungrounded side of C57. Connect the positive lead to chassis.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point (K). Low side to chassis	44 0MC (10MC Swp)	41.25MC	Any	Vert. Amp. thru 10KΩ to point (J). Low side to chassis.	A1	Adjust to place 41.25MC marker in trap notch as in Fig. 1.
2.	"	"	"	42.75MC 45.75MC	"	"	A2, A3	Adjust for response curve similar to Fig. 1 with markers properly located.
3.	"	"	"	41.25MC 41.65MC 42.75MC 45.75MC	"	Vert. Amp. thru 10KΩ to point (J). Low side to chassis.		Check for response curve similar to Fig.3. If necessary, make SLIGHT compromise adjustment of A2 and A3 to obtain desired response. Repeat step 1.
4.	"	High side to pin 1 (grid) of 1st video IF amplifier (V4). Low side to chassis.	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point (J). Low side to chassis.	A4, A5, A6	Adjust for response curve similar to Fig.3. Adjust A4 to form high frequency side of curve and to position 45.75MC marker. Adjust A5 to form the low frequency side of the curve. A6 is adjusted to correct the response curve tilt.
5.	"	"	"	41.65MC	"	Vert. Amp. thru 10KΩ to point (J). Low side to chassis.		Retouch A5 to place 41.65MC marker in correct position as shown in Fig. 4.
6.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point (J). Low side to chassis.		Retouch A4 and A6 if necessary to obtain response curve similar to Fig. 3. DO NOT readjust A5 or step 5 will have to be repeated.
7.	Direct	High side to tube shield fioating over converter tube . Low side to chassis.	44MC (10MC Swp)	41.25MC 47.25MC	9	High side thru 10KΩ to point (A). Low side to chassis.	A7, A8	Preset R21 to mid-range position. Adjust to place markers in trap notches as in Fig.3.
8.	"	"	"	41.65MC 45.75MC	"	"	A9, A10	Adjust for maximum amplitude and response as in Fig. 3. Repeat step 7. Adjust sound trap adjustment (R21) for maximum trapping action of 41.25MC.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to point (H). Low side to chassis.	Not used	4.5MC (30% 400~ AM Mod.)	Any	Vert. Amp. thru detector probe (Fig. 5) to pin 5 (plate) of V24. Low side to chassis.	All	Adjust for MINIMUM indication on scope.
10.	"	High side to pin 1 (grid) of 2nd. sound IF tube (V11). Low side to chassis.	4.5MC (25KC Swp)	4.5MC	"	Vert. Amp. to point (A). Low side to chassis.	A13, A13	Adjust for maximum amplitude and symmetry of "S" curve as in Fig. 8.
11.	"	High side to point (H). Low side to chassis.	4.5MC (25KC Swp)	4.5MC	"	"	A14, A15	Reduce sweep generator output below the limiting level of the 2nd. sound IF coil (L16) indicated by sharp tuning action of A14. Adjust A14 and A15 for maximum amplitude of the "S" curve. Increase sweep generator output and repeat step 10.
12.	"	"	Not used	4.5MC (30% 400~ AM Mod.)	"	"	R23	Adjust for MINIMUM AM modulation shown on scope.

VIDEO AMPLIFIER ALIGNMENT

Disconnect L12 from terminal "D" of L10.
Disconnect R73 from pin 1 of the video amplifier (V8).
Disconnect the grounded side of R72 and connect the positive lead of a 3 volt battery to the loose end of R72. Connect the positive lead of the battery to ground.
Connect a 22KΩ resistor from point (F) to chassis. Remove the picture tube socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	330ΩΩ Carbon Resistor	High side to loose end of L12. Low side to chassis.	2MC (4MC Swp)	3.1MC 3.58MC	Any	Vert. Amp. thru low capacity probe to point (F). Low side to chassis.	A16, A17	Adjust A16 to place 3.58MC marker at zero as in Fig. 7. Adjust A17 for maximum gain and response as in Fig. 6. Reconnect L12, R73 and R72. Remove 22KΩ resistor from point (F) to chassis.

FIG. 10

FIG. 11

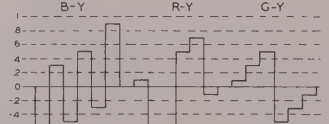


FIG. 12

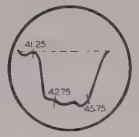


FIG. 1

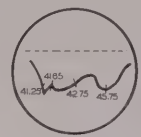


FIG. 2

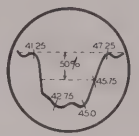


FIG 3

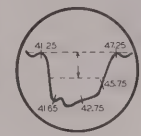


FIG. 4

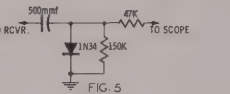


FIG. 5

FIG. 6

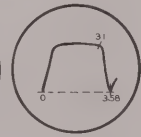


FIG. 7

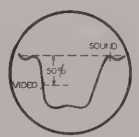


FIG. 8

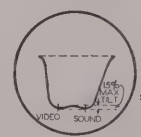


FIG. 9

OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to terminal 9 on the rear of the tuner. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (K). Low side to chassis.	A18	Adjust to place sound marker in trap notch as in Fig. 8. Video marker should be at 50%.
15.	"	"	207MC (10MC Swp) 201MC (10MC Swp) 195MC (10MC Swp) 189MC (10MC Swp) 183MC (10MC Swp) 177MC (10MC Swp)	205.75MC 199.25MC 193.75MC 187.25MC 181.75MC 175.25MC 179.75MC	13 11 10 9 8 7	"		Check for video and sound marker placement as in Fig. 8. If necessary, make compromise adjustment of A18 for any individual channel. Check all other high band channels to see that they have not been seriously affected.
16.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A19	Adjust to place sound marker in trap notch as in Fig. 8.
1	"	"	79MC (10MC Swp) 73MC (10MC Swp) 67MC (10MC Swp) 61MC (10MC Swp) 55MC (10MC Swp)	77.25MC 81.75MC 67.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	5 4 3 2			Check for sound and video marker placement as in Fig. 8. If necessary, make compromise adjustment of A19 for any individual channel. Check all other low band channel to make sure that they have not been seriously affected.

RF AND MIXER ALIGNMENT

Leave bias connected as under "Oscillator alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (K). Low side to chassis.	A20, A21	Adjust for maximum of 15% tilt with markers in proper position as in Fig. 8.
19.	"	"	207MC (10MC Swp) 201MC (10MC Swp) 195MC (10MC Swp) 189MC (10MC Swp) 183MC (10MC Swp) 177MC (10MC Swp) 171MC (10MC Swp) 165MC (10MC Swp) 159MC (10MC Swp) 153MC (10MC Swp) 147MC (10MC Swp) 141MC (10MC Swp) 135MC (10MC Swp) 129MC (10MC Swp) 123MC (10MC Swp) 117MC (10MC Swp) 111MC (10MC Swp) 105MC (10MC Swp) 99MC (10MC Swp) 93MC (10MC Swp) 87MC (10MC Swp) 81MC (10MC Swp) 75MC (10MC Swp) 69MC (10MC Swp) 63MC (10MC Swp) 57MC (10MC Swp)	205.75MC 199.25MC 193.75MC 187.25MC 181.75MC 175.25MC 169.75MC 163.25MC 157.75MC 151.25MC 145.75MC 139.25MC 133.75MC 127.25MC 121.75MC 115.25MC 109.75MC 103.25MC 97.75MC 91.25MC 85.75MC 79.25MC 73.75MC 67.25MC 61.75MC 55.25MC 59.75MC	12 11 10 9 8 7 6 5 4 3 2	"		Check for response curve similar to Fig. 9 on all channels. If necessary, make compromise adjustment of A20 and A21 to obtain desired response. Check all other channels to see that they have not been seriously affected.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

CHROMINANCE CHANNEL ALIGNMENT

Connect the vertical amplifier of the scope thru a low capacity probe to terminal "C" of the 3.58MC oscillator transformer (L32) and adjust A22 for maximum peak to peak indication of the 3.58MC signal on the scope.
Remove the burst amplifier tube (V26) to eliminate erroneous indications in the scope trace.
The high voltage may be disabled by removing the horizontal sweep circuit fuse (M7).
Disconnect luminance detector (M9) from point (H). Set the chroma control fully clockwise and the contrast control fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	330ΩΩ Carbon Resistor	High side to point (H) thru 330ΩΩ. Low side to chassis.	3.75MC (3.5MC Swp)	3 1MC 4.1MC 4.5MC	Any	Vert. Amp. thru detector probe (Fig. 5) to pin (grid) of 6CB6 (V24). Low side to chassis	A23, A24	Adjust for maximum gain and response as in Fig. 10.
21.	"	"	"	"	"	Vert. Amp. thru detector probe (Fig. 5) to pin 2 (grid) of 6CL6 (V25). Low side to chassis.	A25, A26	"
22.	"	"	"	3.1MC 4.1MC	"	Vert. Amp. thru detector probe (Fig. 5) to pin 1 (plate) of 12BH7 (V30). Low side to chassis.	A27, A28	Adjust for maximum gain and response similar to Fig. 11. Check response at the plate of R-Y demodulator (pin 8 of V30) and retouch A27 and A28 for best compromise if necessary.

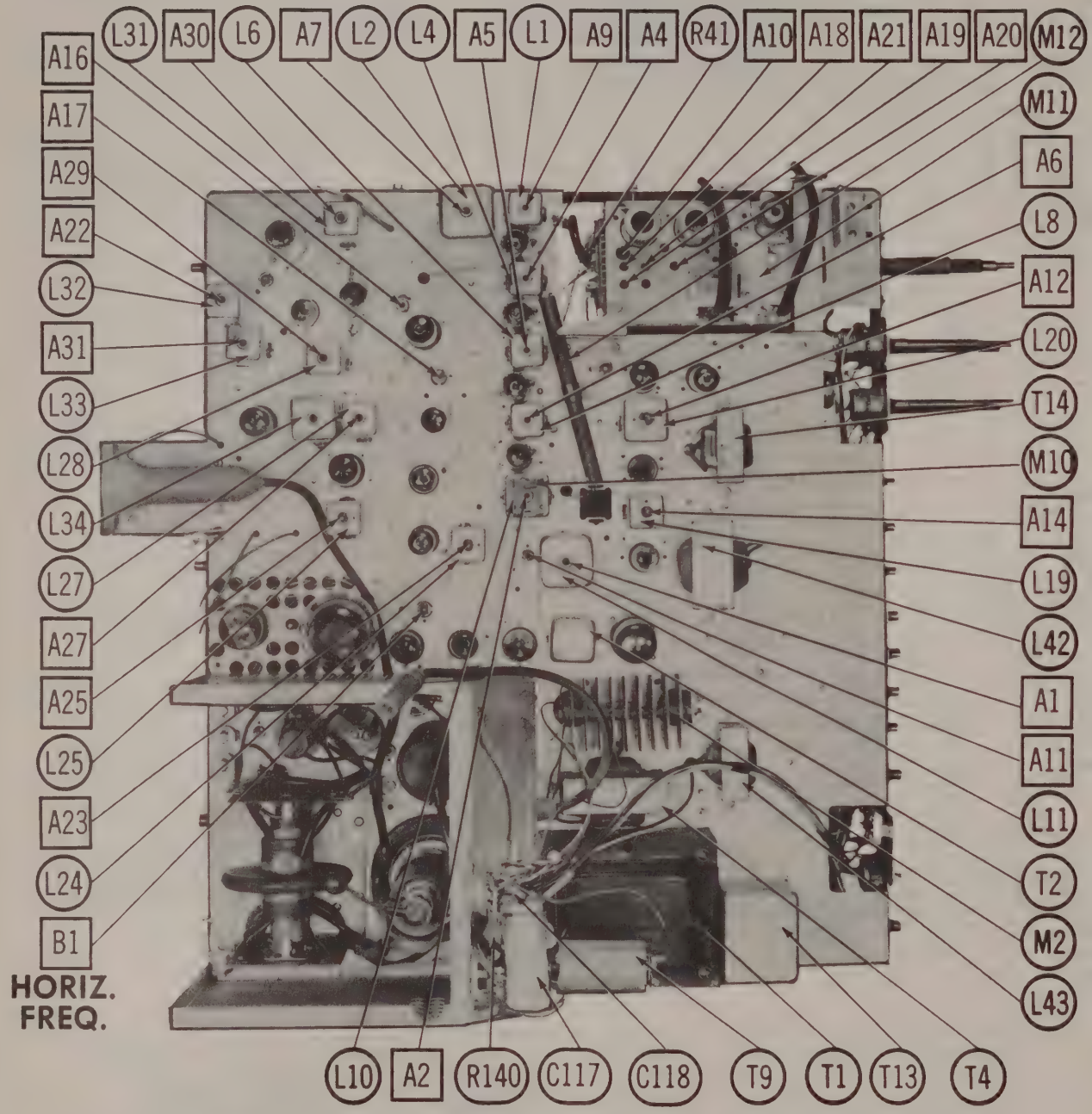
COLOR SYNCHRONIZATION ALIGNMENT

Connect the color bar generator across the antenna terminals and carefully tune the receiver to the color bar pattern.
Connect the low capacity probe of the scope to pin 5 (plate) of the phase detector (V27) and adjust A29 for maximum amplitude of the burst on the scope.
Connect the DC probe of the V7VM to terminal "F" of the "Burst Amplifier" transformer (L28). Disable the 3.58MC oscillator (V29) by connecting a short clip lead from pin 2 of V28 to chassis. Adjust the AFC balance control (R22) so that rotation of the hue control (R5) from one extreme to the other results in an equal change in voltage above and below zero. Remove the short from pin 2 of V28 to chassis and the V7VM. Short terminal "F" of L28 to chassis with a short clip lead. Adjust the reactance tube plate coil (A30) so that the color bars slowly drift back and forth thru the pattern on the picture screen. Remove the short from terminal "F" of L28. The 3.58MC oscillator should now is sync with the bar pattern.

DEMODULATOR ADJUSTMENTS

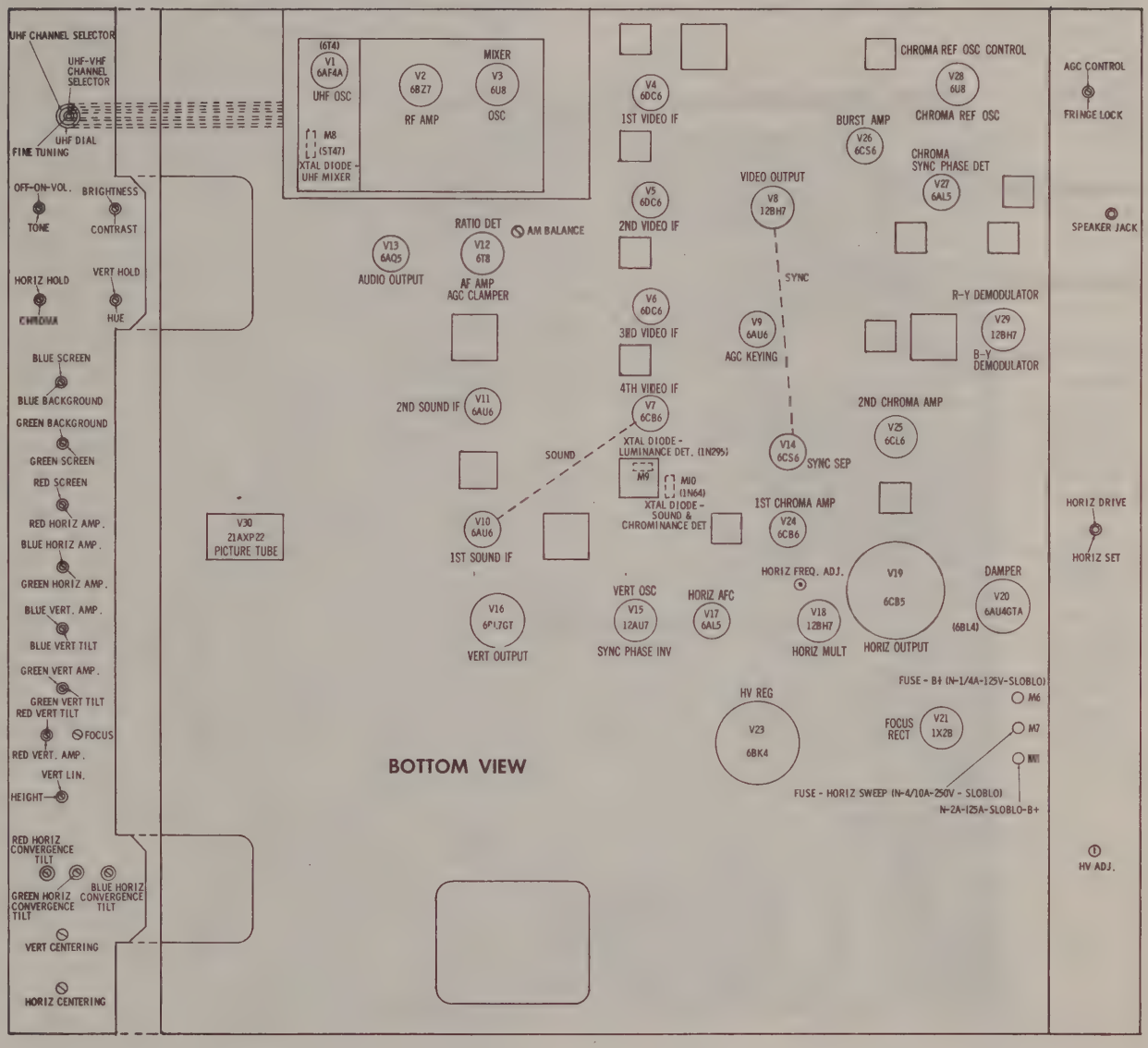
Connect "Color Bar Generator" across the antenna terminals. Connect the vertical amplifier of the scope thru a low capacity probe to the red grid of the picture tube. Low side to chassis.
Set the hue control to mid-position. Adjust A29 until the color bars appear in their proper ratio as in Fig. 12B. When the proper relationship has been obtained, move the scope probe to the blue grid of the picture tube and adjust A31 until the color bars appear in their proper ratio on the scope as seen in Fig. 12A.
Check the waveform on the green grid and compare to Fig. 12C. When ratios cannot be brought within reasonable tolerance, slight corrections can be made with hue and chroma controls.

CAPEHART MODEL 31T216M-5 (Ch. CXC-13)



CHASSIS TOP VIEW

TUBE PLACEMENT CHART



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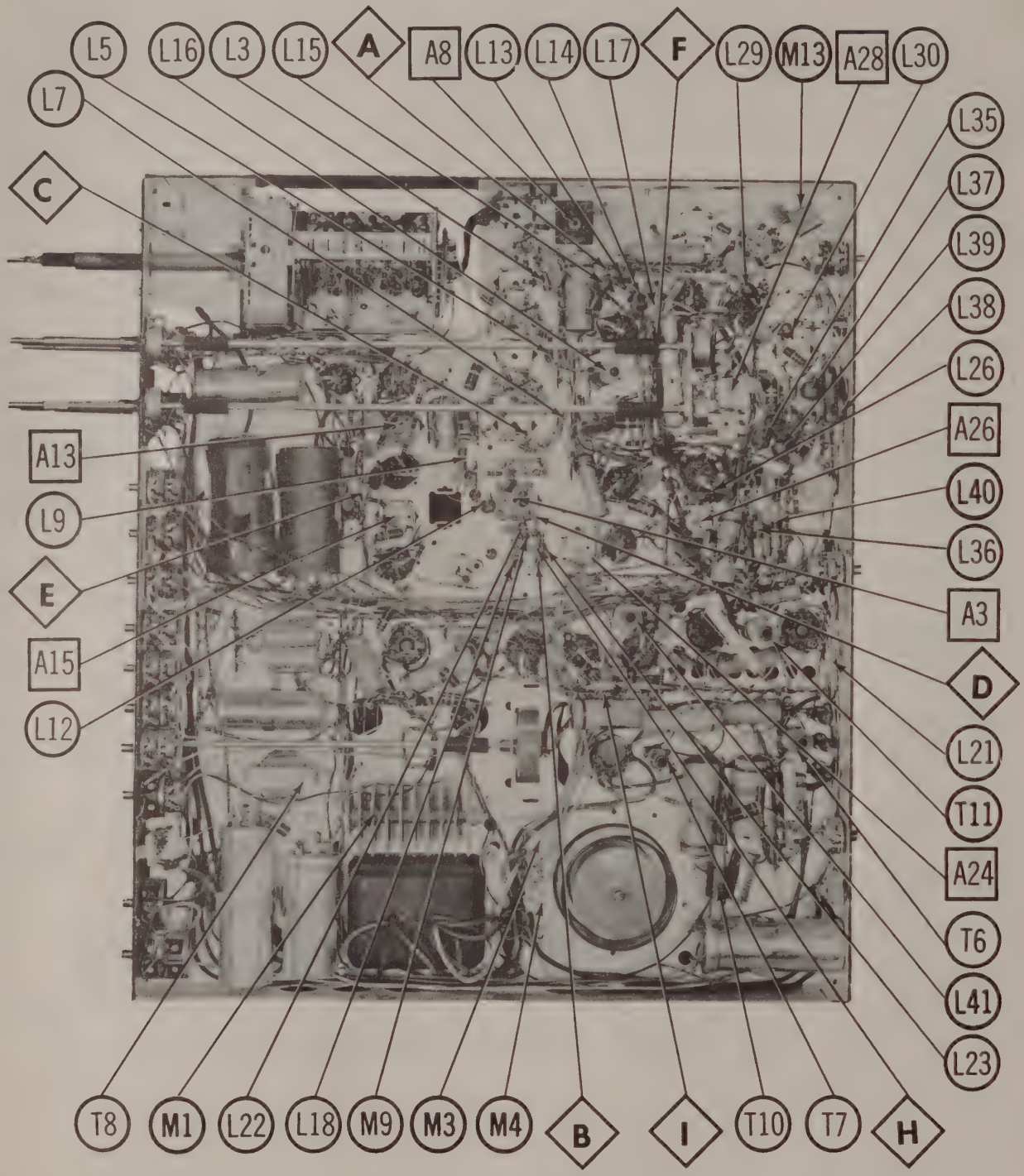
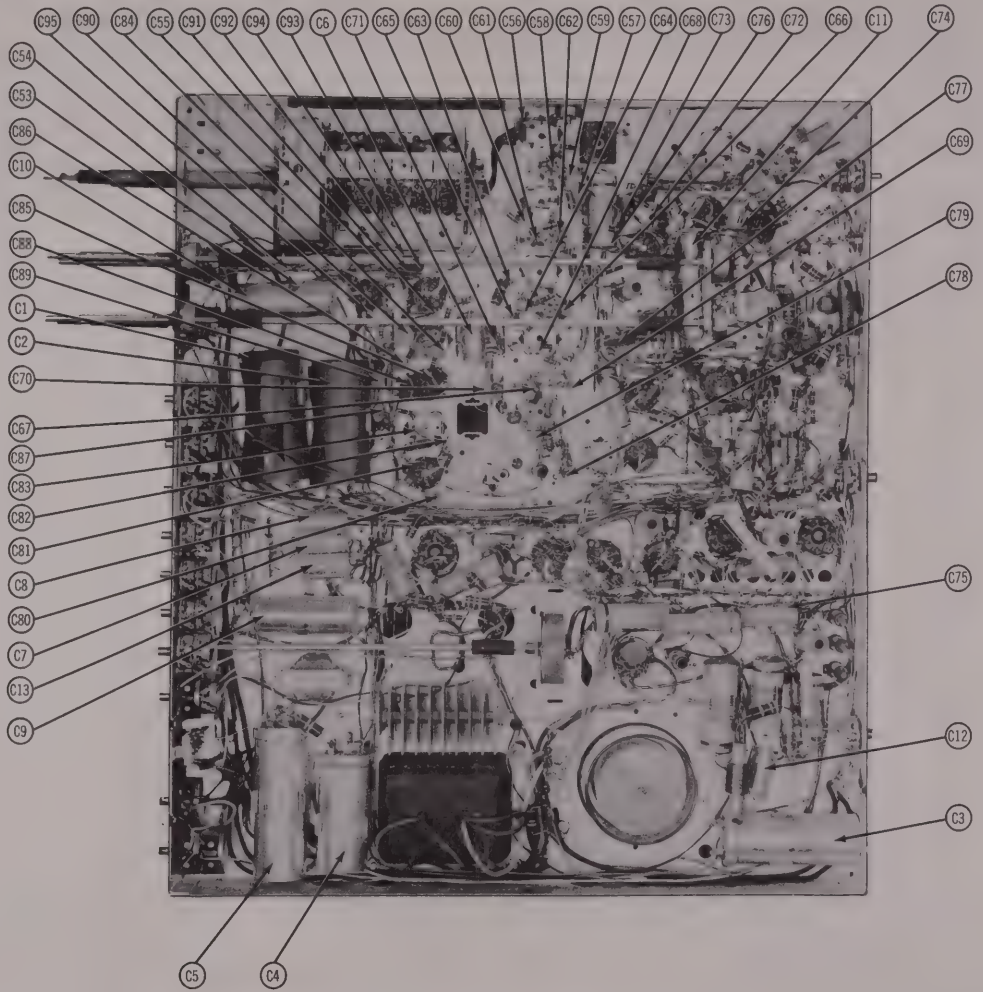
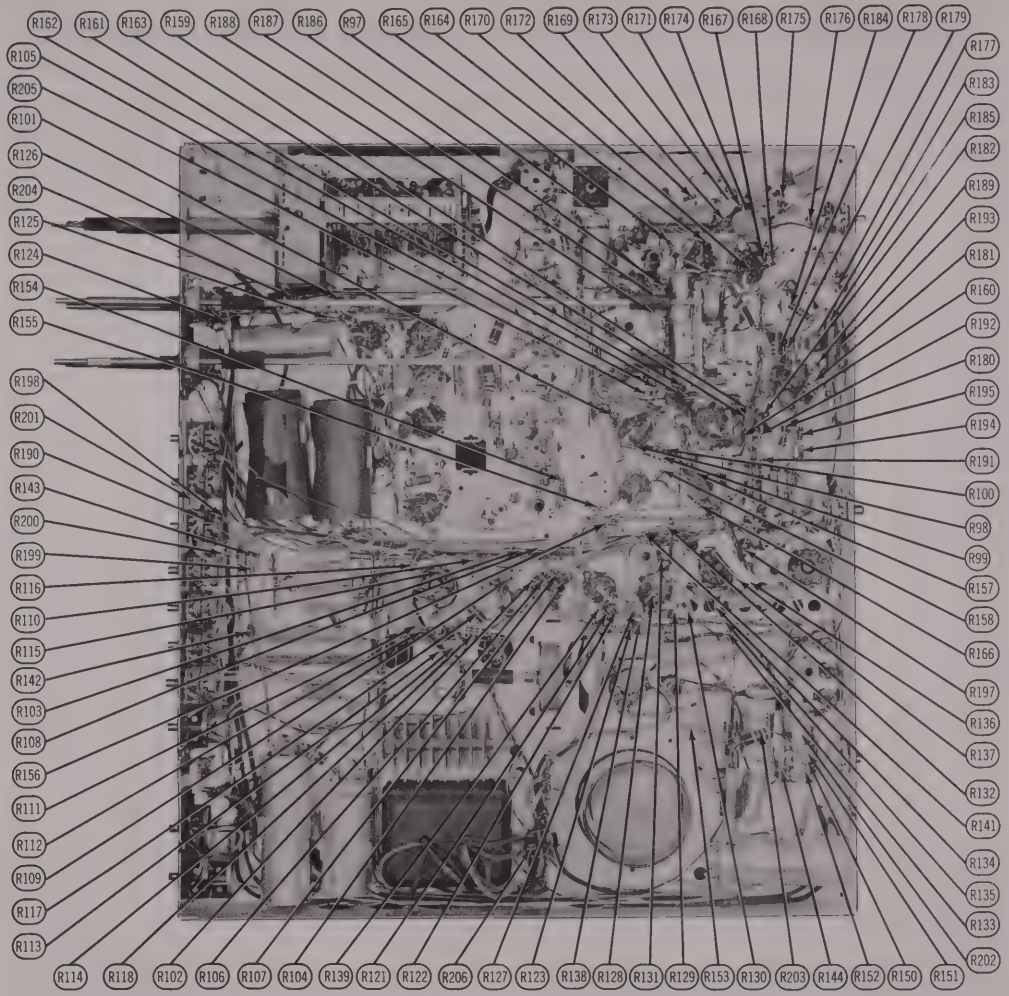


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION (C1- C95)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION (R97-R206)

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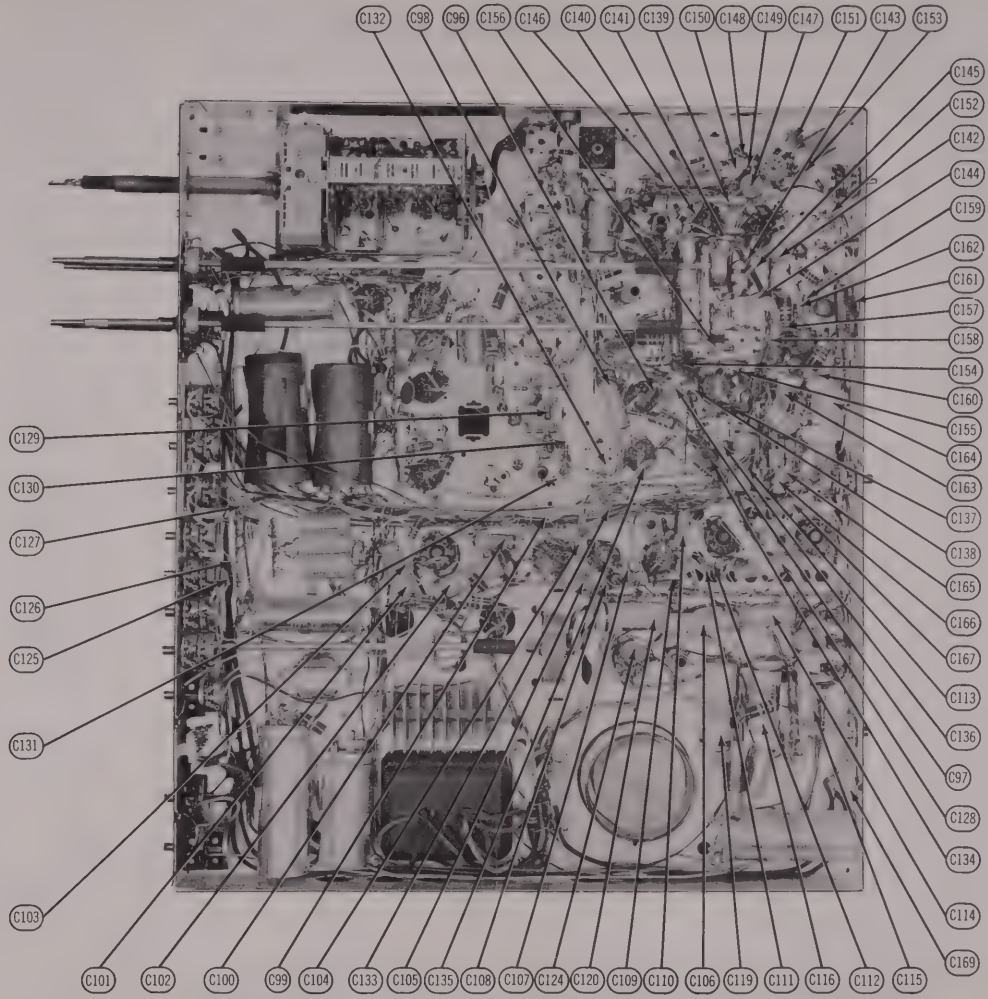
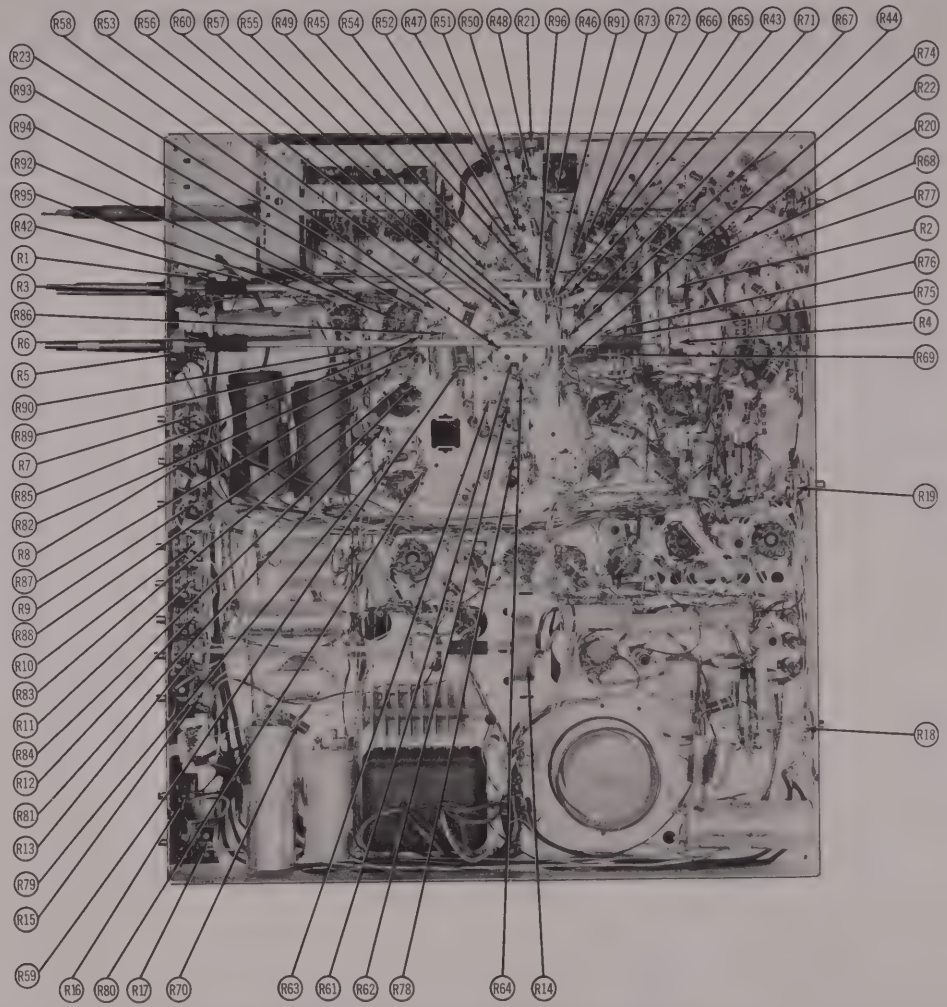


CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION (C96- C169)



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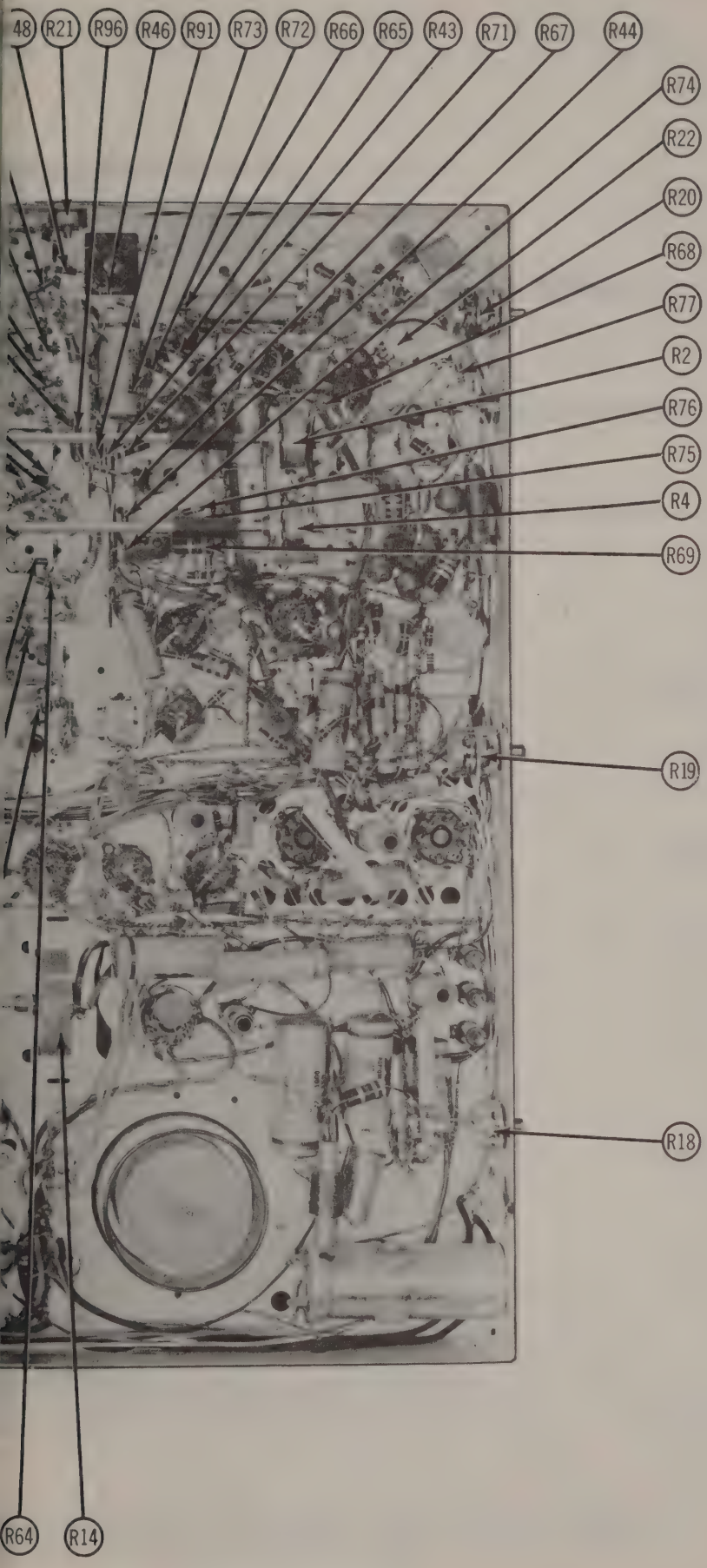
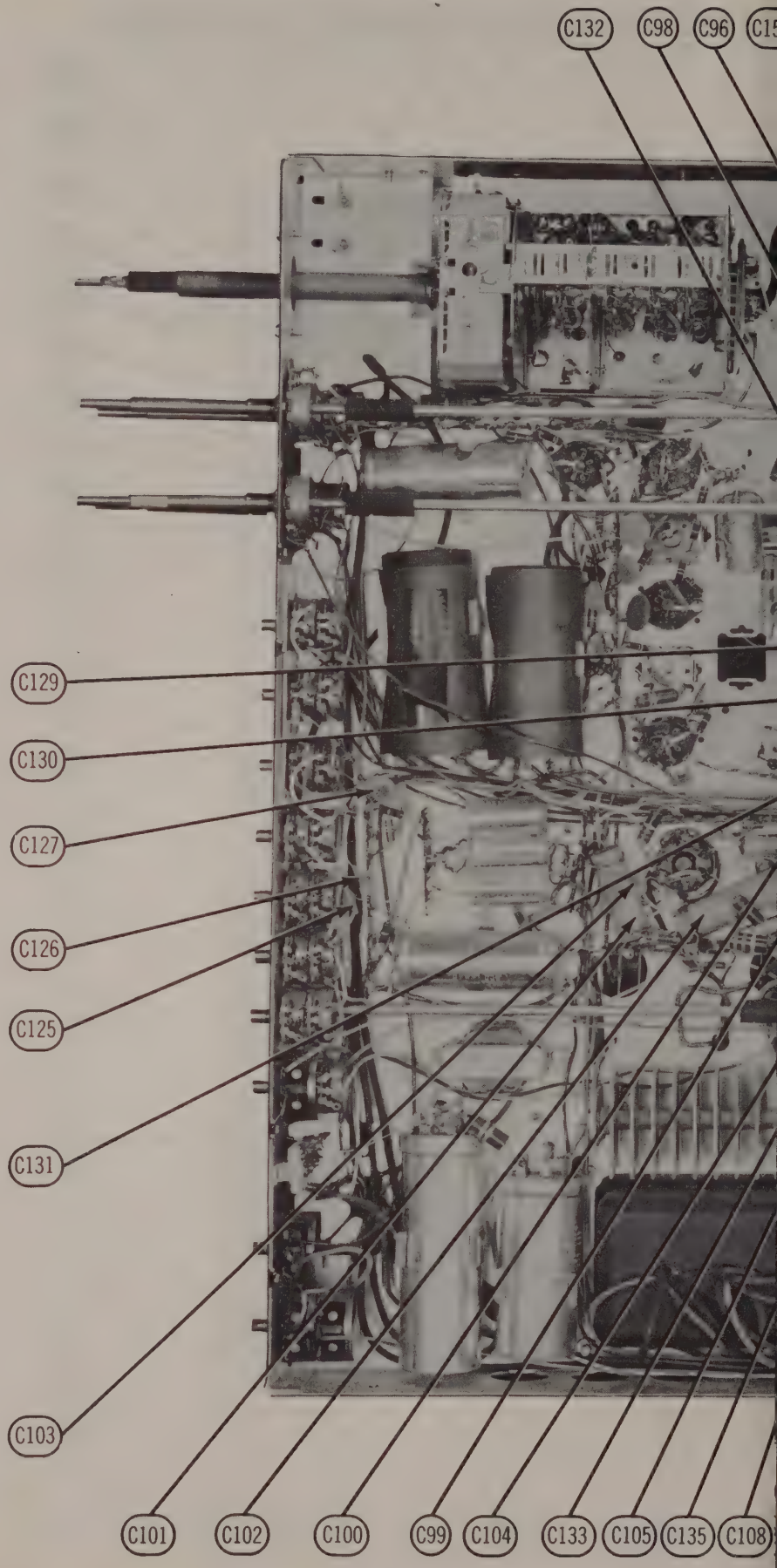
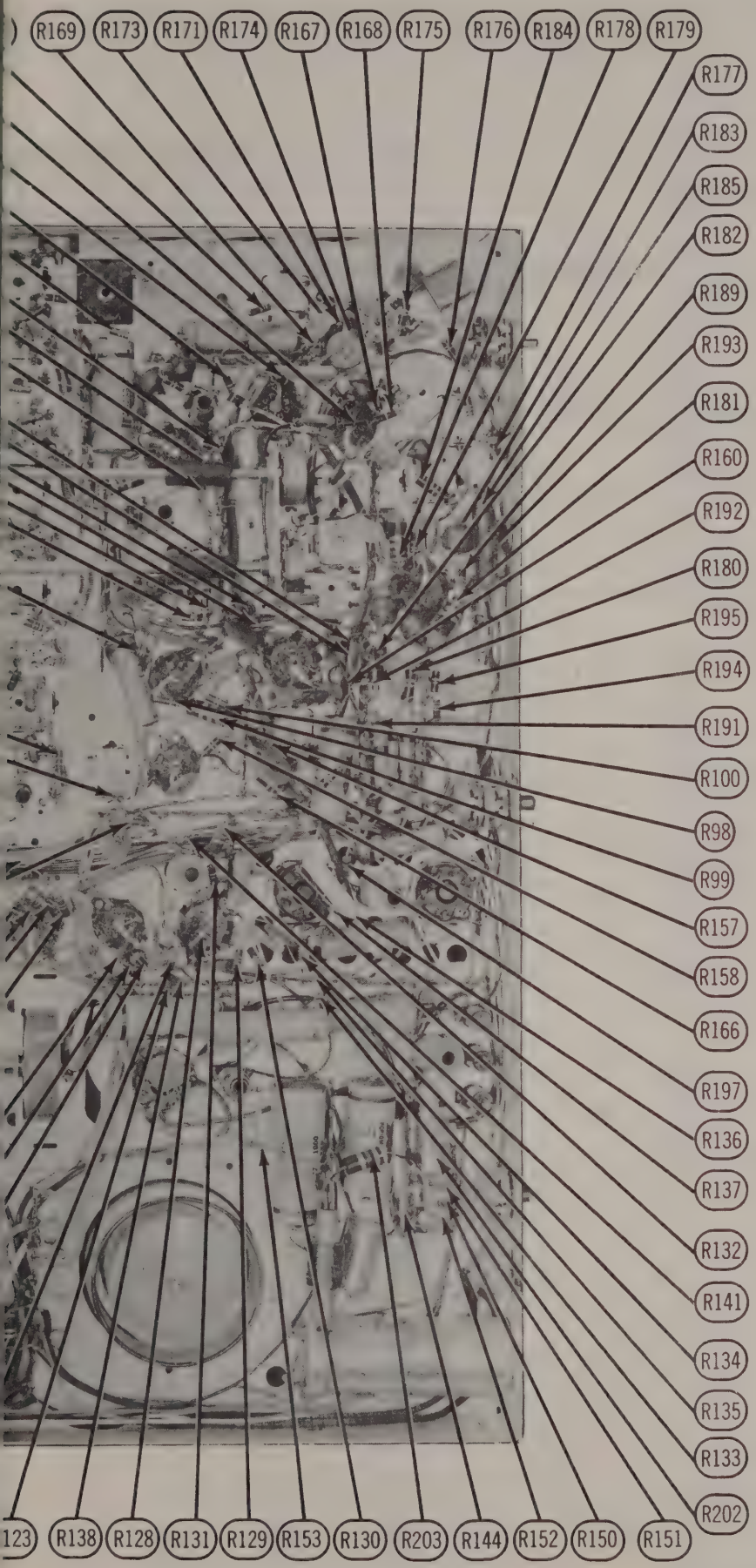


R IDENTIFICATION (R1- R96)



CHASSIS-BOTTOM VIEW-CAPACI



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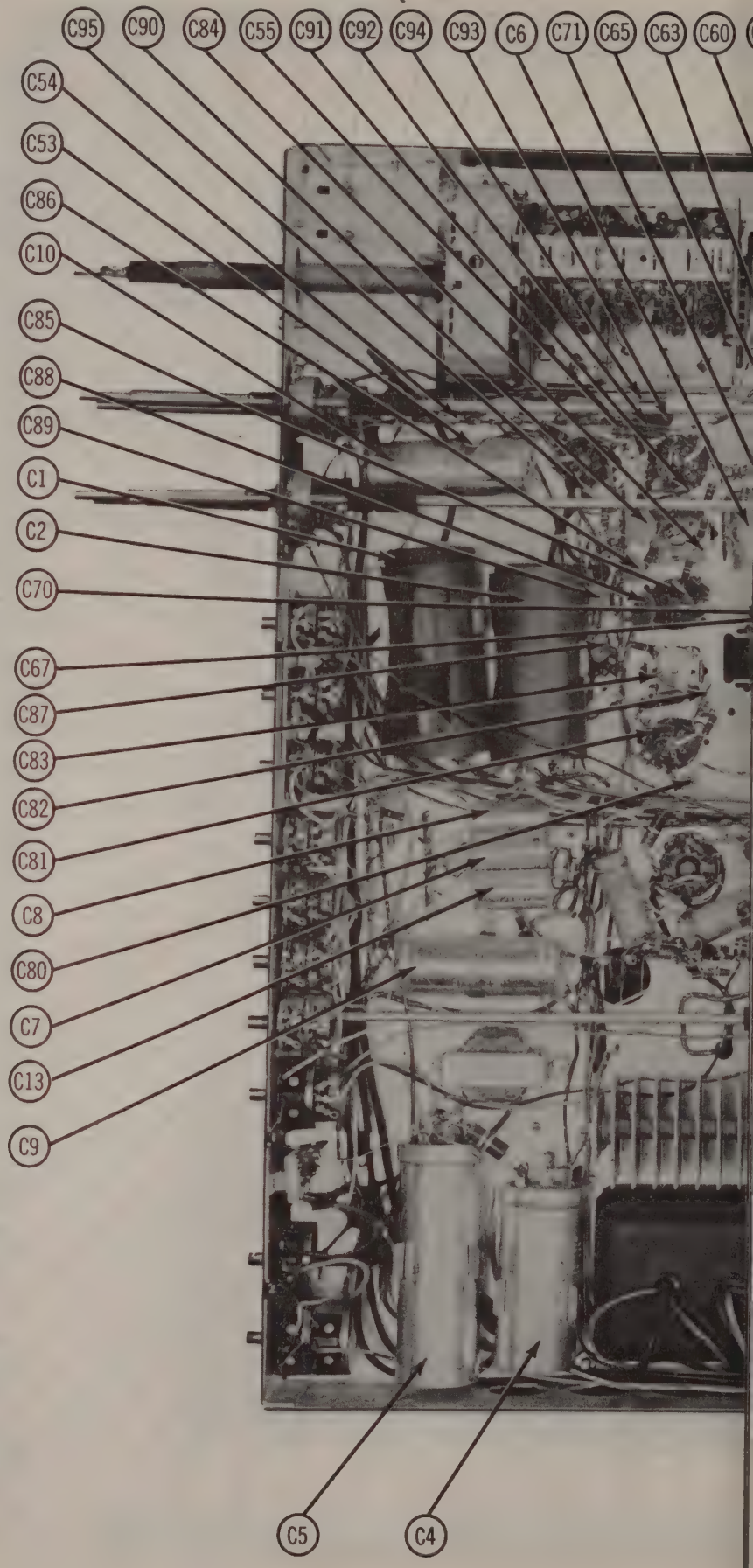
IDENTIFICATION (R97 - R206)



CHASSIS BOTTOM VIEW-CAPAC

MISCELLANEOUS ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short clip lead from the center arm of the horizontal hold control (R6) to chassis. Connect another clip lead across the horiz. freq. coil (L41). Loosely couple the vertical amplifier lead of the scope to the lead between C75 and pin 5 (plate) of the AGC Keying tube (V9). Do not permit the scope lead to come in direct contact with this wire. Adjust the oscilloscope to obtain two horizontal retrace pulses.

Adjust the horizontal drive control (R19B) until a pip appears on the scope between the two pulses. Readjust the drive control until the pip just disappears.

Connect the DC probe of the VTVM to point ⓘ. Connect the common lead to chassis. Adjust the horizontal set control (R19A) for zero reading on the VTVM.

Remove the short from across the horiz. freq. coil and readjust the drive control following the previously outlined method. Adjust the horiz. freq. coil (B1) for zero volts on the VTVM. Remove the short from the center arm of the horizontal hold control.

HIGH VOLTAGE ADJUSTMENT

Connect a VTVM across R153. (The 1000Ω resistor in the cathode circuit of the H. V. Regulator (V23). Set the brightness and contrast controls fully counter clockwise. Adjust the H. V. Adjustment (R18) to the point where the meter reads .6 volts. If a reliable high voltage meter is available, this setting may be made by adjusting for 25,000 volts on the high voltage anode.

STATIC CONVERGENCE AND PURITY ADJUSTMENTS

1. Turn the set on and tune in a TV station with a monochrome signal. Adjust the set for normal operation.
2. Turn the contrast, red screen, green screen and blue screen controls fully counter clockwise.
3. Turn the brightness control up two thirds from full counter clockwise.
4. Adjust the red, blue and green screens clockwise until a low level white screen is obtained.
5. Connect the RF dot generator across the antenna terminals or if a video dot generator is used, connect it to the output of the video detector.
6. Turn the contrast control clockwise until the dots are just visable.
7. Check the location of the convergence coil assembly to make sure that each coil is directly over its respective pole piece in the picture tube neck. The correct position of the convergence coil assembly will place approximately 3 1/4 inches of neck glass between it and the picture tube base. Make certain that the Blue-Gun Coil is pointed upward.
8. Turn all horizontal and vertical amplitude controls fully counter clockwise and set all horizontal and vertical tilt adjustments to approximately mid-range.
9. Adjust each of the Static Convergence magnets to obtain a misconverged dot pattern in the center of the screen.
10. Adjust the red, blue and green convergence magnets and the blue beam-positioning magnet to superimpose the three dots to form a single white dot at the center of the screen.
11. Disconnect the dot generator.
12. Pull all of the field equalizing magnets on the field equalizing assembly out to their farthest position from the picture tube.
13. Turn the contrast, blue screen, green screen, blue background and green background controls fully counter clockwise.
14. Turn the red screen control fully clockwise.
15. Adjust the purity device, starting with the red tabs together, by rotating each ring magnet with respect to the other and/or the entire assembly to achieve MINIMUM contamination of the red raster. At this point it may be necessary to loosen the deflection yoke and slip it either forward or backward to obtain the most uniform red raster. Readjust the purity device if necessary.
16. Reconnect the dot generator and turn up the blue and green screen controls to obtain a white dot at the center of the screen. It may be necessary to reconverge the dots by adjusting the convergence magnets as in step 10.

    If the purity is not as good as was obtained in step 15 repeat step 15.
17. Again turn the blue and green screen controls fully counter clockwise and note any remaining color contamination about the edges of the screen if there is any. These areas may be corrected by adjusting the field equalizing magnets nearest the area contaminated. It may be necessary to make slight readjustment of the purity device as outlined in step 15.
18. Adjust the red, blue and green screen controls to obtain a high level white screen. If any color contamination still remains around the edges of the screen, readjust the individual field equalizing magnets nearest the areas of contamination.
19. Check and readjust the static convergence if necessary.

VERTICAL DYNAMIC CONVERGENCE ADJUSTMENT

With the dot generator still connected check for proper static convergence in the center of the screen.

1. Turn the red vertical amplitude fully clockwise and adjust the red vertical tilt control for maximum displacement of the red dots from the cyan dots at the center of the screen along the vertical row of dots nearest the center of the screen.
2. Turn the green vertical amplitude control fully clockwise and adjust the green vertical tilt control for maximum displacement of the green dots from the red dots in this same vertical line.
3. Turn the blue screen control fully counter clockwise so that only the red and green dots are visable.
4. Adjust the green and red vertical amplitude and tilt control to obtain straight vertical rows of red and green dots equally spaced from each other along the entire vertical line nearest the center of the screen.
5. Converge the two vertical rows of dots nearest the center of the screen using the red and green static convergence magnets to produce a single vertical row of yellow dots. If the dots are displaced near the top or bottom of the vertical row of dots repeat steps 4 and 5 until all the dots in this row appear to be yellow with no indication of fringing of either red or green.
6. Turn up the blue screen control until the blue dots are visable and then set the blue vertical amplitude control fully clockwise.
7. Note the displacement of the blue dots with respect to the yellow dots along this same vertical row, then alternately adjust the blue vertical amplitude and blue vertical tilt controls until the displacement of the blue dots is uniform along the entire vertical row.
8. Converge the vertical row of blue dots with the vertical row of yellow dots by using the blue convergence magnet and if necessary, the blue beam-positioning magnet. This should result in a vertical row of white dots.

HORIZONTAL DYNAMIC CONVERGENCE ADJUSTMENT

1. Turn the red horizontal amplitude control fully clockwise and adjust the red horizontal tilt trimmer B2 for maximum displacement of the red dots from the cyan dots along the horizontal row of dots nearest the center of the screen.
2. Turn the green horizontal amplitude control fully clockwise and adjust the green horizontal tilt trimmer B3 for maximum displacement of the green dots from the red dots along this same horizontal line.
3. Turn the blue screen control fully counter clockwise so that only the red and green dots are visable.
4. Adjust the red and green horizontal amplitude and tilt B2, B3 to obtain straight horizontal rows of red and green dots equally spaced from each other along the entire horizontal line nearest the center of the screen.
5. Converge the two horizontal rows of dots nearest the center of the screen using the red and green static convergence magnets to produce a single horizontal row of yellow dots. If the dots are displaced near the right or left hand side of the screen repeat steps 4 and 5 until all the dots in this row appear to be yellow with no indication of fringing of red or green.
6. Turn up the blue screen until the blue dots are visable and then set the blue horizontal amplitude control fully clockwise.
7. Note the displacement of the blue dots with respect to the yellow dots along this same horizontal row, then alternately adjust the blue horizontal amplitude and the blue horizontal tilt trimmer B4 until the displacement of the blue dots is uniform along the entire horizontal row.
8. Converge the horizontal row of blue dots with the horizontal row of yellow dots by using the blue convergence magnet and if necessary, the blue beam-positioning magnet. If these adjustments have been properly made, the entire screen area should now show optimum convergence of the dot pattern.

GRAY SCALE ADJUSTMENT
WHITE ADJUSTMENT

1. Remove the dot generator and connect the antenna to the antenna terminals. Tune in a TV station with a monochrome signal.
2. Turn the contrast and chroma controls fully counter clockwise.
3. Set the brightness control for normal brightness level and set the blue and green background controls to approximately mid-range.
4. Adjust the blue and green screen controls to produce a low brightness white raster. The color of the white should appear about the same as a low brightness setting on a standard black and white picture tube.

HIGH-LIGHT AND LOW-LIGHT ADJUSTMENT

1. Set the contrast to mid-position.
2. Observe the high-light areas of the picture and again adjust the red, blue, green screen controls for a white raster.
3. Turn the brightness control down and note the low-light areas of the picture and if one or more colors predominate adjust the proper screen control to reduce that color. Adjust the blue and green background controls to again produce a low brightness white screen.
4. Repeat these adjustments until proper tracking is obtained between low-light and high-light areas as the contrast control is varied.

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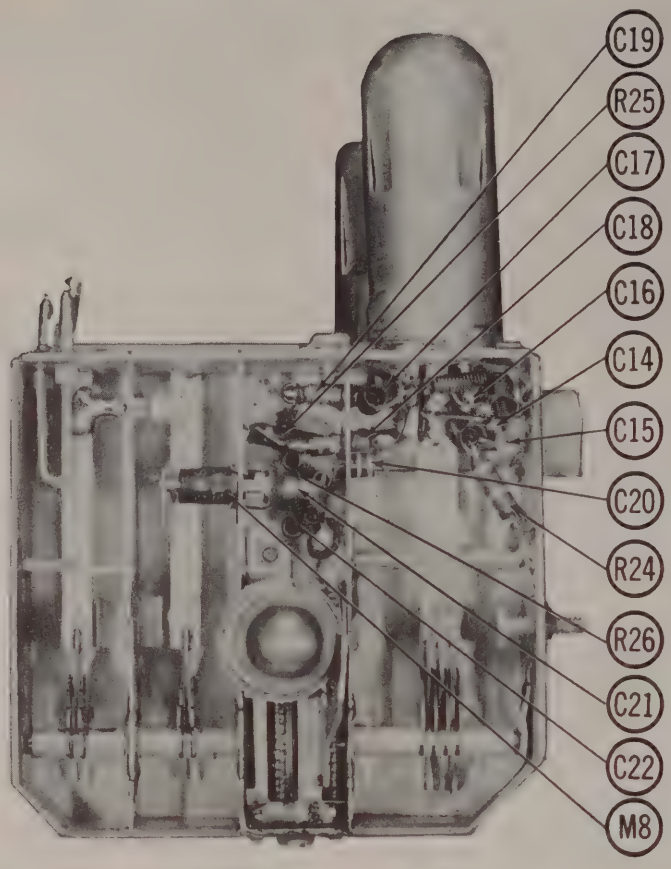
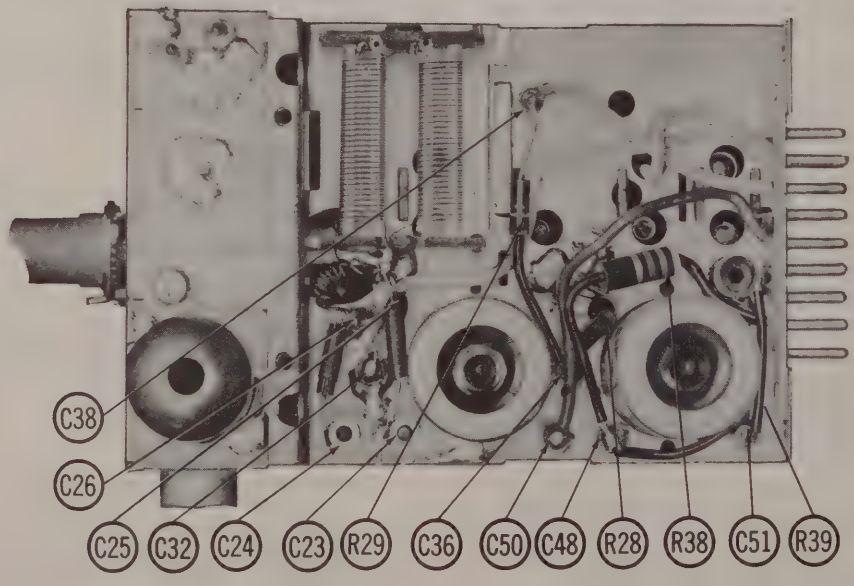


UHF TUNER FRONT VIEW



RF TUNER TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4A	Note 1
V2	RF Amplifier	6BZ7	
V3	Mixer-Oscillator	6U8	
V4	1st. Video IF Amplifier	6DC6	
V5	2nd. Video IF Amplifier	6DC6	
V6	3rd. Video IF Amplifier	6DC6	
V7	4th. Video IF Amplifier	6CB6	
V8	Video Output	12BY7	
V9	AGC Keying	6AU6	
V10	1st. Sound IF Amplifier	6AU6	
V11	2nd. Sound IF Amplifier	6AU6	
V12	Ratio Detector-AF Amplifier-AGC Clamper	6T8	
V13	Audio Output	6AQ5	
V14	Sync Separator	6CS6	
V15	Vert. Osc.-Sync Phase Inv.	12AU7	
V16	Vert. Output	6BL7GT	
V17	Horiz. AFC	6AL5	
V18	Horiz. Mult.	12BH7	
V19	Horiz. Output	6CB5	
V20	Damper	6AU4GTA	Note 2
V21	Focus Rectifier	1X2B	
V22	HV Rectifier	3B2	
V23	HV Regulator	6BK4	
V24	1st. Chroma Amplifier	6CB6	
V25	2nd. Chroma Amplifier	6CL6	
V26	Burst Amplifier	6CB6	
V27	Chroma Sync Phase Det.	6AL5	
V28	Chroma Ref. Osc. Cont.-Chroma Ref. Osc.	6U8	
V29	R-Y Demodulator-B-Y Demodulator	12BH7	

Note 1. 6T4 may be used in some versions.
Note 2. 6BL4 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	CAPEHART PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V30	21AXP22			21AXP22	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CAPEHART PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	250		AFHS1-31-80		FP126	TM-200-250	S-160 MT-2540	R2067 *
C2	200	250		AFHS1-31-80		FP126	TM-200-250	S-160 MT-2540	R2067 *
C3A	▲80	475		AFH2-101-75	C036	FP262	TMD-93	S-305	R2241 *
B	▲20	400				TC75		MT-4520	
C4	200	250							
C5A	▲80	350		AFH4-104-50		FP377.4	TMQ-122	Q-055	R2242 *
B	10	250				TC80	TD-50-450	MT-4580	
C	■10	400							
D	▲60	400							
C6	4	150		PRS150V4	BR415	TC40	TD-4-150	FM-1504	TVA-1402
C7	4	50		PRS150V4	BR550	TC30	TD-4-50	MMT-0505	TVA-1303
C8	25	50		PRS50V25	BR255	TC36	TD-25-50	FM-0525	TVA-1306
C9	500	10	(Note 1)	PRS10VNP500	BRH1510 ‡ BRH1510 ‡	TC412		D-015 †	
C10	1000	15		PRS15V1000	BRH1510	TC1501	TD-1000-15	S-020	TVA-1163
C11	4	150		PRS150V4	BR415	TC40	TD-4-150	FM-1504	TVA-1402
C12	10	25		PRS25V10	BR102	TC22	TD-10-25	FM-0210	TVA-1204
C13	20	25		SRE25V20	BR202	TC26	TD-25-25	FM-0225	TVA-1205

Note 1. Non-polarized unit.
* Unit must be ordered from Mfgr.
† Use positive terminals only. Insulate case.
‡ Connect negative leads together.

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FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C14	1-4									
C15	1.5									
C16	170									
C17	170									
C18	1000									
C19	1000									
C20	1.1									
C21	3.6									
C22	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C23	5-10									
C24	5-10									
C25	150									
C26	15									
C27	18									
C28	5.1									
C29	15									
C30	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C31	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C32	1000									
C33	4									
C34	2.7									
C35	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C36	1000									
C37	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	1000									
C39	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	.3									
C41	.56									
C42	.91									
C43	15			NP0-DI15	TCZ-15	Z021	NP0K-150		5TCC-T15	
C44	1.2									
C45	1.5									
C46	10									
C47	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	1000									
C49	1000									
C50	1000									
C51	5									
C52	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

SET 327 FOLDER 3

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C56	33			NP0A-DI33	TCZ-33	Z029	NP0L-330	ZT-5433	5TCC-Q33	
C57	20000			BPD-02	DD-203	K045	817-02		5HK-S2	
C58	680			DI680	DD-681	K065	811-681	UC-5368	5GA-T68	
C59	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C60	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C61	680			DI680	DD-681	K065	811-681	UC-5368	5GA-T68	
C62	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C63	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C64	680			DI680	DD-681	K065	811-681	UC-5368	5GA-T68	
C65	680			DI680	DD-681	K065	811-681	UC-5368	5GA-T68	
C66	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C67	680			DI680	DD-681	K065	811-681	UC-5368	5GA-T68	
C68	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C69	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C70	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C71	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C72	150			1469-00015	TCZ-150	22R5T15	NP0-334-151	ZT-5315	5TCC-T15	
C73	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C74	47			N330-SI47	TCA-47	G056	N330L-470			
C75	470			BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C76	.47	400		P488N-47		CUB4P47		PT4047	4TM-P47	
C77	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C78	15			NP0-DI15	DD-150	Z021	831-150	UC-5215	5TCC-Q15	
C79	33			NP0-DI33	TCZ-33	Z029	NP0L-330	ZT-5433	5TCC-T33	
C80	10				TCA-10		N330A-100			
C81	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C82	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C83	47			N330-SI47	TCA-47		N330L-470			
C84	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C85	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C86	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C87	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C88	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C89	150			N750-DI150	TCN-150	N046	N750-337-151		5TCU-Q15	
C90	6800			BPD-0068	DD-681	K061	811-0068		5HK-D68	
C91	470			BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C92	10000			BPD-01	DD-103	K082	811-01	DC-521	5HK-S1	
C93	10000			BPD-01	DD-103	K082	811-01	DC-521	5HK-S1	
C94	10000			BPD-01	DD-103	K082	811-01	DC-521	5HK-S1	
C95	3300			BPD-0033	D6-332	K077	811-0033	UC-5233	5HK-D33	
C96	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C97	100			N750-DI100	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C98	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C99	12000		†453214A-1	†PA-501	†PC-104				†103C12	
C100	.01	600		BPD-01	DD-103	CUB6S1	GP3-333-103	PT611	6TM-P1	
C101	.1	400		P488N-1	DF-104	CUB4P1		PT411	4TM-P1	
C102	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C103	2200	2000		HVD-30-2200	DD30-222	VD22	1R5KV-222	DC30222		
C104	1000			DI001	DD-102	K069	801-001	DC-521	5GA-D1	
C105	1000			DI001	DD-102	K069	801-001	DC-521	5GA-D1	
C106	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C107	2200			DI0022	D6-222	K073	811-0022	UC-5222	5HK-D22	
C108	.01	400		BPD-01	DD-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C109	270	500		NP0-SI270	D6-271	22R5T27	NP0-335-271		MS-327	
C110	4700	500		1464-0047		1R5D47			MS-247	
C111	390	500			D6-391	5R5T39	811-391		MS-339	
C112	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C113	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C114	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C115	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C116	.22	600		P688N-22		CUB6P22		PT6022	6TM-P22	
C117	.22	1000								
C118	.022	1000		P1088N-022		CUB16S22		PT16122	10TM-S22	
C119	.22	1000								
C120	.47	200		P288N-47		CUB2P47		PT4027	2TM-P47	
C121	1200	10000								
C122	1200	10000								
C123	2500	30000								
C124	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C125	2200			BPD-0022	D6-222	K073	811-0022	UC-5222	5HK-D22	
C126	2200			BPD-0022	D6-222	K073	811-0022	UC-5222	5HK-D22	
C127	2200			BPD-0022	D6-222	K073	811-0022	UC-5222	5HK-D22	
C128	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C129	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C130	10			NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C131	10			NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C132	100			N750-DI10	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C133	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C134	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C135	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C136	1000			DI001	DD-102	K069	801-001	DC-521	5HK-D1	
C137	330			1469-00033	D6-331	5R5T33			MS-333	
C138	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C139	1000			DI001	DD-102	K069	801-001	DC-521	5HK-D1	
C140	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C141	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C142	1000			DI001	DD-102	K069	801-001	DC-521	5HK-D1	
C143	1000			DI001	DD-102	K069	801-001	DC-521	5HK-D1	
C144	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C145	1000			DI001	DD-102	K069	801-001	DC-521	5HK-D1	
C146	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C147	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C148	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C149	220			N750-DI220	TCN-220	TN30	N750-337-221		5TCU-T22	
C150	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C151	220			BPD-00022	TCN-220	TN30	N750-337-221		5TCU-T22	
C152	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C153	82			DI000082	TCN-82	TN20	N750L-820			
C154	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C155	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C156	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C157	15				TCA-15		N330K-150			
C158	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C159	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C160	220			N750-DI220	TCN-220	TN30	N750-337-221		5TCU-T22	
C161	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C162	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C163	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C164	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C165	680			BPD-00068	DD-681	K065	811-681	UC-5368	5GA-T68	
C166	.01	1000		P1088N-01	DD-103	CUB16S1		PT16S1	10TM-S1	
C167	.01	1000		P1088N-01	DD-103	CUB16S1		PT16S1	10TM-S1	
C168	150			HVD-30-150	DD30-151	V3T15	6KV-151		30GA-T15	
C169A	1500	1000		HVD-15-1500	DD-152	VD15	1R5KV-152	DC30215	10GA-D15	
B	1500	1000		HVD-15-1500	DD-152	VD15	1R5KV-152	DC30215	10GA-D15	

† Items C99, R108A and R108B are combined in one unit.

PARTS LIST AND DESC

CONTR

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT D CAPEHART PART No.	CENTRALAB PART No.	CLAROSTA PART No.
R1A	1Meg	½	850366A-10	F1-51	RTV-586
B	1. 5Meg	½		R2-66	
C	Switch			KB-1	
R2	500KΩ	½	850341A-19		
R3A	15KΩ	½	850341A-25		A47-15K-8
B	Shaft		Not Req.		RS-3/16
R4	1Meg	½	850341A-20		
R5A	10KΩ	½	850341A-18	AB-15	A47-10K-2
B	Shaft		Not Req.	AK-8	RS-3/16
R6A	10KΩ	½	850366A-11	F1-23	
B	2000Ω	½		R2-9	
R7A	1Meg	½	850366A-16	F1-51	
B	500KΩ	½		R2-40	
R8A	1Meg	½	850366A-16	F1-51	
B	500KΩ	½		R2-40	
R9A	1Meg	½	850366A-15	F1-51	
B	1000Ω	½		R2-4	
R10A	1000Ω	½	850366A-7	F1-4	
B	1000Ω	½		R2-4	
R11A	2500Ω	½	850366A-6	F1-12	
B	1000Ω	½		R2-4	
R12A	2500Ω	½	850366A-6	F1-12	
B	1000Ω	½		R2-4	
R13A	2500Ω	½	850366A-6	F1-12	
B	1000Ω	½		R2-4	
R14	7. 5Meg	½	750728A-1		
R15A	1500Ω	2	850366A-5	F7-72	
B	2Meg	½		R2-67	
R16	100Ω	2	850341A-22		
R17A	100Ω	2	850366A-8		
B	100Ω	2			
R18A	200KΩ	½	850341A-17	AB-46	A47-200K-8
B	Shaft		Not Req.	AK-1	FKS-1/4
R19A	200KΩ	½	850366A-9	F1-33	
B	10KΩ	½		R2-23	
R20A	7. 5Meg	½	850366A-13	F1-83	
B	500KΩ	½		R2-40	
R21	2500Ω	½	850341A-24		
R22	250KΩ	½	651150A-3		
R23	2300Ω	½	651150A-1		

* Concentrikit Equivalent, K-4 Kit, Base Elements and Shaft

** Concentrikit Equivalent, K-15 Kit, Base Elements and Shaf

† Concentrikit Equivalent, K-15 Kit, Base Elements and Shaf

†† Concentrikit Equivalent, K-15 Kit, Base Elements and Shaf

♦ Concentrikit Equivalent, K-15 Kit, Base Elements and Shaf

♦♦ Concentrikit Equivalent, K-15 Kit, Base Elements and Shaf

■ Concentrikit Equivalent, K-15 Kit, Base Elements and Shaf

‡ Saw slot in shaft.

RESIS

All wattages 1/2 watt, or les

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CAPEHART PART No.	IRC PART No.	NOTES
R24	6800Ω				
R25	1000Ω			BTS-1000	
R26	150Ω			BTS-150	
R27	100KΩ			BTS-100K	
R28	1Meg 5%			BTS-1Meg 5%	
R29	750KΩ 5%			BTS-750K 5%	
R30	470Ω			BTS-470	
R31	56KΩ				
R32	56KΩ				
R33	6800Ω				
R34	15KΩ			BTS-15K	
R35	150KΩ			BTS-150K	
R36	3300Ω	1		BTA-3300	
R37	39KΩ			BTS-39K	
R38	470Ω	1		BTA-470	
R39	100Ω			BTS-100	
R40	56Ω			BTS-56	
R41	27Ω 5%			BTS-27 5%	
R42	4700Ω	2		BTB-4700	
R43	820Ω			BTS-820	
R44	47KΩ			BTS-47K	
R45	470KΩ			BTS-470K	
R46	470Ω			BTS-470	
R47	2200Ω			BTS-2200	
R48	22KΩ 5%				
R49	220Ω			BTS-220	
R50	47Ω 5%			BTS-47 5%	
R51	10KΩ			BTS-10K	
R52	27KΩ 5%				
R53	1000Ω	2		BTB-1000	
R54	56Ω 5%			BTS-56 5%	
R55	39KΩ			BTS-39K	
R56	47KΩ			BTS-47K	
R57	27KΩ 5%				
R58	10KΩ			BTS-10K	
R59	390Ω	2		BTB-390	
R60	56Ω 5%			BTS-56 5%	
R61	4700Ω 5%				
R62	10Ω			BTS-10	
R63	560Ω			BTS-560	
R64	330Ω			BTS-330	
R65	10KΩ			BTS-10K	
R66	3900Ω 5%			BTS-3900 5%	
R67	8200Ω			BTS-8200	
R68	3900Ω	2		BTB-3900	
R69	2700Ω	2		BTB-2700	
R70	15KΩ	2		BTB-15K	
R71	3900Ω	2		BTB-3900	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
				REPLACEMENT DATA						
C56	33			NP0A-D133	TC2-33	Z029	N.P.O.-330	Z7-5433	5TCC-Q33	
C57	20000			BPD-02	DD-203	K065	S17-02		5HK-S2	
C58	680			DI680	DD-681	K065	S1-681	UC-5368	5GA-T68	
C59	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C60	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C61	680			DI680	DD-681	K065	S1-681	UC-5368	5GA-T68	
C62	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C63	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C64	680			DI680	DD-681	K065	S1-681	UC-5368	5GA-T68	
C65	680			DI680	DD-681	K065	S1-681	UC-5368	5GA-T68	
C66	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C67	680			DI680	DD-681	K065	S1-681	UC-5368	5GA-T68	
C68	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C69	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C70	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C71	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C72	150			1469-00015	TC2-150	32R5715	NP0-334-151	Z7-5315	5TCC-T15	
C73	5000			BPD-005	DD-502	K060	S01-005	DC-525	5HK-D5	
C74	47			N330-4047	TCA-47	K056	N330L-470		5GA-S47	
C75	470			BPD-00047	DD-471	K060	S1-471	UC-5347	5GA-T47	
C76	.47	400		P484M-47		CUB4P47		P76047	47TM-P47	
C77	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C78	18			DI-180	DD-180	2021	S31-150	UC-5215	5TCC-Q15	
C79	33			N90-D33	TCE-33	2039	N.P.O.-330	Z7-5433	5TCC-T33	
C80	10				TCA-10		N330A-100			
C81	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C82	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C83	47			N330-4247	TCA-47		N330L-470		5GA-S47	
C84	5000			BPD-005	DD-502	K060	S01-005	DC-525	5HK-D5	
C85	5000			BPD-005	DD-502	K060	S01-005	DC-525	5HK-D5	
C86	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C87	1000			BPD-001	DD-102	K069	S01-001	DC-521	5HK-D1	
C88	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C89	150			N750-D1250	TCN-150	N046	N750-337-151		5TCU-Q15	
C90	5600			BPD-0056	DD-681	K065	S1-0056		5HK-D68	
C91	470			BPD-00047	DD-471	K060	S1-471	UC-5347	5GA-T47	
C92	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C93	10000			BPD-01	DD-103	K062	S1-01	DC-521	5HK-S1	
C94	10000			BPD-01	DD-103	K062	S1-01	DC-521	5HK-S1	
C95	3300			BPD-0033	DD-333	K073	S1-0033	DC-5333	5HK-D33	
C96	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C97	100			N750-D1200	TCN-100	TN32	N750L-101	NT-5101	5TCU-T1	
C98	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C99	12000		†453214A-1	†PA-501	†PC-104			PT6101	†103C12	
C100	.01	500		BPD-01	DD-103	CUB6S1	GP3-333-103	PT611	6TM-P1	
C101	.1	400		P488N-1	DF-104	CUB4P1		PT41	4TM-P1	
C102	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C103	3200	2000		HVD-30-2200	DD30-222	VD22	1R5KV-222	DC30222		
C104	1000			DI001	DD-103	K069	S01-001	DC-521	5GA-D1	
C105	1000			DI001	DD-103	K069	S01-001	DC-521	5GA-D1	
C106	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C107	2200			DI0022	DD-223	KD73	S1-0022	UC-5322	5HK-D22	
C108	.01	400		BPD-01	DD-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C109	270	500		NP0-S2270	D6-271	22R5727	NP0-335-271		MS-327	
C110	4700	500		1464-00047		1R5D547			MS-347	
C111	390	500			D6-391	5R5739	S1J-391		MS-339	
C113	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C114	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C115	.1	600		P668N-1	DF-104	CUB6P1		PT601	6TM-P1	
C116	.1	600		P668N-1	DF-104	CUB6P1		PT601	6TM-P1	
C117	.22	600		P868N-23		CUB6P22		PT6022	6TM-P22	
C118	.22	1000								
C119	.033	1000		PI068N-023		CUB6S23		PT6123	10TM-S23	
C120	.22	1000								
C121	.47	200		P288N-47		CUB2P47		PT4027	2TM-P47	
C123	1200	10000								
C124	1200	10000								
C125	2500									
C126	2200			BPD-0022	D6-223	KD73	S1-0022	UC-5322	5HK-D22	
C127	2200			BPD-0022	D6-223	KD73	S1-0022	UC-5322	5HK-D22	
C128	.1			P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C129	2.2			NP0-E22	TC2-220	TZ05			5TCC-B-V22	
C130	10			NP0-E20	TCE-10	TZ09	NP0A-100	Z7-541	5TCC-Q10	
C131	10			NP0-E10	TCE-10	TZ09	NP0A-100	Z7-541	5TCC-Q10	
C132	100			N750-D110	TCN-100	TN23	N750L-101	NT-531	5TCU-T1	
C133	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C134	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C135	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C136	1000			DI001	DD-103	K069	S01-001	DC-521	5HK-D1	
C137	330			1469-00033	D6-331	5R5733			MS-333	
C138	5000			BPD-005	DD-502	K060	S1-005	DC-525	5HK-D5	
C139	1000			DI001	DD-103	K069	S01-001	DC-521	5HK-D1	
C140	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C141	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C142	1000			DI001	DD-103	K069	S01-001	DC-521	5HK-D1	
C143	1000			DI001	DD-103	K069	S01-001	DC-521	5HK-D1	
C144	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C145	1000			DI001	DD-103	K069	S01-001	DC-521	5HK-D1	
C146	.22	400		P288N-22		CUB2P22		PT4022	2TM-P22	
C147	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C148	1.2			NP0-E12	TC2-120	TZ05	NP0A-120		5TCC-B-V12	
C149	330			N750-D1230	TCN-330	TN30	N750-337-331		5TCU-T33	
C150	5000			BPD-005	DD-502	K060	S1-005	DC-525	5HK-D5	
C151	330			BPD-00033	TCN-330	TN30	N750-337-331		5TCU-T33	
C152	68			BPD-006	DD-502	K060	S1-005	DC-525	5HK-D6	
C153	82			D000083	TCN-82	TN30	N750L-820			
C154	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C155	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C156	5000			BPD-005	DD-502	K060	S1-005	DC-525	5HK-D5	
C157	15				TCA-15		N330K-150			
C158	33			NP0-D133	TCE-33	3034	NP0A-330		5TCC-Q33	
C159	20000			BPD-02	DD-203	K065	S17-02		5HK-S2	
C160	330			N750-D1230	TCN-330	TN30	N750-337-331		5TCU-T33	
C161	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C162	20000			BPD-02	DD-203	K065	S17-02		5HK-S2	
C163	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C164	10000			BPD-01	DD-103	K062	S1-01	DC-511	5HK-S1	
C165	680			BPD-00068	DD-681	K065	S1-681	UC-5368	5GA-T68	
C166	.01	1000		PI068N-01	DD-103	CUB6S1		PT6S1	10TM-S1	
C167	.01	1000		PI068N-01	DD-103	CUB6S1		PT6S1	10TM-S1	
C168	150			HVD-30-150	DD30-151	VS715			30GA-T15	
C169A	1500	1000		HVD-15-1500	DD-153	VD15	1R5KV-152	DC30215	10GA-D15	
B	1500	1000		HVD-15-1500	DD-153	VD15	1R5KV-152	DC30215	10GA-D15	

† Items C99, R108A and R108B are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST ANCE	RATING WATTS	CAPEHART PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
				REPLACEMENT DATA				
R1A	1Meg	½	850366A-10	F1-51	RTV-586		UF16L	Tone (Treble)
B	1.5Meg	½		R2-58			UR26-T35	Volume tapped at 325K (Rear)
C	Switch			KD-1			US-26	Attach to R1B.
R2	500KΩ	½	850341A-19					Brightness
R3A	15KΩ	½	850341A-25		A47-15K-S			Contrast
B	Shaft		Not Req.		R8-3/16			Attach to R3A.
R4	1Meg	½	850341A-20					Vert. Hold
R5A	10KΩ	½	850341A-18		AB-15	A47-10K-Z	Q13-118	U18	Hue
B	Shaft		Not Req.		AK-9		NQ	DS-37	Attach to R5A.
R6A	10KΩ	½	850366A-11		F1-53		* QJ-1017	UF16L	Horiz. Hold (Panel)
B	200KΩ				R2-93			UR33L	Chroma (Rear)
R7A	1Meg	½	850366A-16		F1-51		**QJ-1016	UF16L	Blue Screen (Panel)
B	150KΩ				R2-40			UR55L	Blue Background (Rear)
R8A	1Meg	½	850366A-18		F1-51		**QJ-1016	UF16L	Green Screen (Panel)
B	500KΩ				R2-40			UR55L	Green Background (Rear)
R9A	1Meg	½	850366A-15		F1-51		† QJ-1015	UF16L	Red Screen (Panel)
B	1000Ω				R2-4			UR19L	Red Horiz. Conv. Amplitude (Rear)
R10A	1000Ω	½	850366A-7		F1-4		†† QJ-1014	UF13L	Green Horiz. Conv. Amplitude (Panel)
B	1000Ω	½			R2-4			UR13L	Blue Horiz. Conv. Amplitude (Rear)
R11A	2500Ω	½	850366A-8		F1-12		+ QJ-1013	UF23LL	Blue Vert. Amplitude (Panel)
B	1000Ω				R2-4			UR13L	Blue Vert. Tilt (Rear)
R12A	2500Ω	½	850366A-8		F1-12		+ QJ-1013	UF23LL	Green Vert. Amplitude (Panel)
B	1000Ω	½			R2-4			UR13L	Green Vert. Tilt (Rear)
R13A	2500Ω	½	850366A-8		F1-12		+ QJ-1013	UF23LL	Red Vert. Amplitude (Panel)
B	1000Ω	½			R2-4			UR13L	Red Vert. Tilt (Rear)
R14	7.5Meg		7507238-1						Focus
R15A	1500Ω	2	850366A-5		F7-72			WF13	Vert. Lin. Wire-Wound (Panel)
B	3Meg	½			R3-67			UR2L	Height (Rear)
R16	100Ω	2	850341A-23				WPH1003X50		Vert. Centering tapped at 50Ω Wire-Wound
R17A	300Ω	2	850366A-9						Horiz. Centering
B	300Ω	2							Wire-Wound
R18A	200KΩ	½	850341A-17		AB-46	A47-200K-S	Q11-139	† T43	High Voltage
B	Shaft		Not Req.		AK-1	FKB-1/4	HQ	Not Req.	Attach to R18A.
R19A	200KΩ	½	850366A-9		F1-53		+*QJ-1011	UF23LL	Horiz. Set (Panel)
B	30KΩ				R2-33			UR13L	Horiz. Drive (Rear)
R20A	7.5Meg	½	850366A-13		F1-83		¤ QJ-1010	UF19LL	Fringe Lock (Panel)
B	500KΩ				R2-60			UR56L	AGC (Rear)
R21	250KΩ	½	850341A-24						Sound Level
R22	250KΩ	½	651150A-3						AFC Balance
R23	2300Ω	½	651150A-1						AM Balance

* Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-116 & P6-218 (Panel) Bil-115 & Ril-516 (Rear)

** Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-137 & P18-016 (Panel) Bil-133 & Ril-009 (Rear)

† Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-137 & P18-016 (Panel) Bil-106 & Ril-009 (Rear)

†† Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-108 & P18-016 (Panel) Bil-108 & Ril-009 (Rear)

+ Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-108 & P18-016 (Panel) Bil-116 & Ril-009 (Rear)

** Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-108 & P18-016 (Panel) Bil-116 & Ril-009 (Rear)

¤ Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; Bil-142 & P18-016 (Panel) Bil-133 & Ril-009 (Rear)

◊ Saw slot in shaft.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	CAPEHART PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R24	680Ω			BTS-1000	
R25	100Ω			BTS-150	
R26	150Ω			BTS-100K	
R27	100KΩ			BTS-100K	
R28	1Meg 5%			BTS-1Meg 5%	
R29	750KΩ 5%			BTS-750K 5%	
R30	470Ω			BTS-470	
R31	68KΩ				
R32	56KΩ				
R33	180KΩ				
R34	15KΩ			BTS-15K	
R35	150KΩ			BTS-150K	
R36	330KΩ	1		BTA-330K	
R37	39KΩ			BTS-39K	
R38	470Ω	1		BTA-470	
R39	100Ω			BTS-100	
R40	9KΩ			BTS-9K	
R41	270 5%			BTS-27 5%	
R43	4700Ω	2		BTS-4700	
R43	820Ω			BTS-820	
R44	47KΩ			BTS-47K	
R45	470KΩ			BTS-470K	
R46	470Ω			BTS-470	
R47	2200Ω			BTS-2200	
R48	33KΩ 5%				
R49	220Ω				
R50	47Ω 5%			BTS-47 5%	
R51	10KΩ			BTS-10K	
R52	27KΩ 5%				
R53	100Ω	2		BTB-1000	
R54	56Ω 5%			BTS-56 5%	
R55	39KΩ			BTS-39K	
R56	47KΩ			BTS-47K	
R57	27KΩ 5%				
R58	10KΩ			BTS-10K	
R59	150Ω	2		BTB-150	
R60	56Ω 5%			BTS-56 5%	
R61	47000Ω 5%				
R62	10Ω			BTS-10	
R63	56Ω			BTS-560	
R64	33Ω			BTS-330	
R65	10KΩ			BTS-10K	
R66	39000Ω 5%			BTS-3900 5%	
R67	8200Ω			BTS-8200	
R68	3900Ω	2		BTB-3900	
R69	2700Ω	2		BTB-2700	
R70	15KΩ	2		BTB-15K	
R71	5900Ω	2		BTB-5900	

ITEM No.	RATING OHMS	RATING WATT	CAPEHART PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R72	100Ω			BTS-100	
R73	33KΩ			BTS-330	
R74	10KΩ			BTS-10K	
R75	22KΩ			BTS-22K	
R76	68KΩ			BTS-68K	
R77	18KΩ			BTS-18K	
R78	470KΩ			BTS-470K	
R79	10KΩ	1		BTA-10K	
R80	33Ω			BTS-33	
R81	100KΩ			BTS-100K	
R82	100Ω			BTS-1000	
R83	100KΩ			BTS-100K	
R84	27KΩ			BTS-27K	
R85	82KΩ			BTS-820	
R86	330Ω			BTS-330	
R87	39KΩ			BTS-390	
R88	68KΩ			BTS-68K	
R89	470KΩ			BTS-470K	
R90	15KΩ			BTS-15K	
R91	1.5Meg			BTS-1.5Meg	
R92	1Meg			BTS-1Meg	
R93	100KΩ			BTS-100K	
R94	6.8Meg			BTS-6.8Meg	
R95	100KΩ			BTS-100K	
R96	10Meg			BTS-10Meg	
R97	47KΩ			BTS-47K	
R98	4.7Meg			BTS-4.7Meg	
R99	18KΩ	2		BTB-18K	
R100	220KΩ			BTS-220K	
R101	560KΩ			BTS-560K	
R103	82KΩ			BTS-82K	
R105	560Ω			BTS-560	
R104	15KΩ			BTS-15K	
R105	10KΩ			BTS-10K	
R106	4300Ω 5%			BTS-4300 5%	
R107	180KΩ			BTS-180K	
R108A	58.4KΩ		†453214A-1		
B					
R109	1Meg			BTS-1Meg	
R110	680KΩ			BTS-680K	
R111	33KΩ			BTS-33K	
R113	22KΩ			BTS-22K	
R113	47KΩ			BTS-47K	
R114	330KΩ			BTS-330K	
R115	2.2Meg			BTS-2.2Meg	
R116	680Ω			BTA-680	
R117	82KΩ	1		BTA-82K	
R118	470Ω	2		BTB-470	

† Items R108A, R108B, C99 are combined in one unit.

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	CAPEHART PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R119	1000Ω			BTS-1000	
R120	100Ω				
R121	100KΩ				
R122	100KΩ				
R123	4.7Meg				
R124	1.5Meg				
R125	150Ω				
R126	150Ω				
R127	470KΩ				
R128	680Ω	1			
R129	1800Ω				
R130	56KΩ				
R131	120KΩ				
R132	10KΩ	1		BTA-470	
R133	680Ω				
R134	180Ω				
R135	680KΩ				
R136	11KΩ	10		PW10-10K	
R137	100KΩ			BTS-100K	
R138	130Ω				
R139	3300Ω				
R140	4700Ω	1			
R141	15KΩ			BTS-15K	
R142	1000Ω				
R143	33KΩ				
R144	12KΩ				
R145	6.7Ω			PW½-6.7	
R146	5.6Meg	2			
R147	470KΩ	2			
R148	470KΩ	2			
R149	2.2Ω			PW½-2.2	
R150	1.5Meg				
R151	330KΩ				
R152	100KΩ				
R153	1000Ω 5%				
R154	560KΩ				
R155	680KΩ			BTS-680K	
R156	330KΩ			BTS-330K	
R157	100KΩ			BTS-100K	
R158	10KΩ			BTS-10K	
R159	3900Ω			BTS-3900	
R160	680Ω			BTS-680	
R161	470Ω	1		BTA-470	
R162	15KΩ	1		BTA-15K	

ITEM No.	RATING OHMS	RATING WATT	CAPEHART PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R163	1000Ω			BTS-1000	
R164	1Meg				
R165	15KΩ			BTS-15K	
R166	220Ω	1		BTA-220	
R167	1Meg			BTS-1Meg	
R168	1Meg			BTS-1Meg	
R169	15KΩ			BTS-15K	
R170	82000Ω			BTS-8200	
R171	2200Ω			BTS-2200	
R172	560Ω			BTS-560	
R173	330KΩ			BTS-330K	
R174	2700Ω			BTS-2700	
R175	100KΩ			BTS-100K	
R176	15KΩ			BTS-15K	
R177	560Ω	1		BTA-560	
R178	12KΩ	3		BTB-12K	
R179	3300Ω			BTS-3300	
R180	22KΩ	1		BTA-22K	
R181	56KΩ	3		BTB-56K	
R182	6800Ω	1		BTA-6800	
R183	3300Ω			BTS-3300	
R184	560Ω	1		BTA-560	
R185	40KΩ	6			
R186	120KΩ			BTS-120K	
R187	33KΩ			BTS-33K	
R189	82KΩ			BTS-82K	
R190	470KΩ			BTS-470K	
R191	56KΩ			BTS-56K	
R192	100KΩ			BTS-100K	
R193	100KΩ			BTS-100K	
R194	560KΩ			BTS-560K	
R195	100KΩ			BTS-100K	
R196	100KΩ			BTS-100K	
R197	100KΩ			BTS-100K	
R198	560KΩ			BTS-560K	
R199	560KΩ			BTS-560K	
R200	330KΩ			BTS-330K	
R201	470KΩ			BTS-470K	
R202	2500Ω	5		PW5-2500	
R203	4700Ω	2		BTB-4700	
R204	680Ω	1		BTA-680	
R206	100KΩ			BTS-100K	
R207	100KΩ	1		BTA-100K	

TRANSFORMER (POWER)

ITEM No.	RATING P.R.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	CAPEHART PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
					REPLACEMENT DATA					
T1	117VAC ① 3.1A	180V Tap ② @ .480A	13.6VCT ③ 6.8A ④ 9.2A	6.3V ⑤ 1.1A	850377C-1					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	CAPEHART PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
		REPLACEMENT DATA							
T3	Vert. Osc. Trans.		A-4055	30ST9	V-62A		A-8133	26A04	A-97Y
T3	Horiz. Output Trans.	850379-A							
T4	Vert. Output Trans.	750791A-2	A-3833		V-30T		A-8144	34H73	A-103X
T5A	Yoke-Horiz. (12MH)	850370-1A							
B	Vert. (90MH)								
T6	Horiz. Lin. Coil (.54-1.6MH C.T.)								
T7	Horiz. AFC Pulse Trans.	851144-1							
T8	Vert. Centering Choke	750798A-1							
T9	Horiz. Centering Choke	851146A-1							
T10	Horiz. Centering Choke		RF800 ① 5 ② 4 ③ 3	MWC-12 ① 5 ② 4 ③ 3	215R1 ① 5 ② 4 ③ 3	20UR10 ① 5 ② 4 ③ 3	WC-5 ① 5 ② 4 ③ 3	WC-30 ① 5 ② 4 ③ 3	WC-11 ① 5 ② 4 ③ 3
T11	Horiz. Conv. Phase Coil (2.2-5.5MH)	851145B-1	RF803 ① 5 ② 4 ③ 3	MWC-4	211R1	20UR12 ① 5 ② 4 ③ 3	WC-9	WC-23	WC-12 ① 5 ② 4 ③ 3
T12A	Green) Dynamic								
B	Blue) Conv. Yoke								
C	Red Assembly								
T13	Dynamic Conv. Inductor Assembly	851147A-1							

① Use 8 to 1 turns ratio.
② Drill new mounting hole(s).
③ Adjust to maximum inductance.
④ Use terminals #1 and #2.
⑤ Use red and blue terminals.
⑥ Use terminals #3 and #4.
⑦ Do not use tap.
⑧ Use blue and green terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	CAPEHART PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
			REPLACEMENT DATA						
T14	8.2KΩ	3-4Ω	850316A-2	21903	A2901	A3540	24S81	S-9Z	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	CAPEHART PART No.	QUAM PART No.	RCA TYPE No.	NOTES
				REPLACEMENT DATA			
SP1	8"	PM	3-4Ω	750797A-1	8A3I	20S83	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC	CAPEHART PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
				REPLACEMENT DATA				
L1	1st Video IF	.3Ω	.3Ω	750742B-1				
L2A	41.25MC Trap							
B	47.25MC Trap			750741B-1				
L3	Fil. Choke	.0Ω						.6 Microhenries
L4	2nd Video IF	.1Ω	.1Ω	750738A-1				
L5	Fil. Choke	.0Ω						.6 Microhenries

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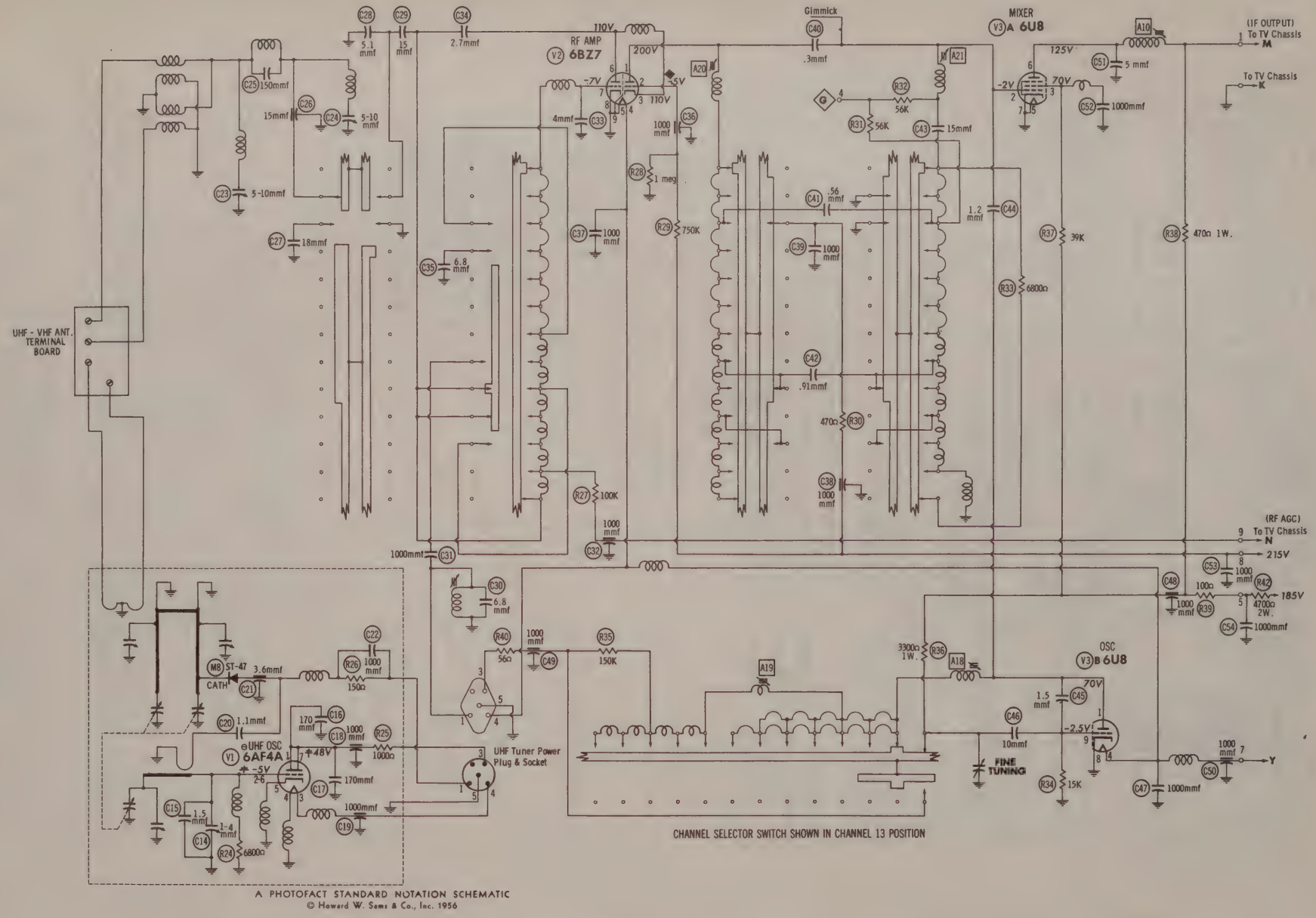
UHF - VHF ANT. TERMINAL BOARD
RF AMP V2 6BZ7
MIXER V3A 6U8
OSC V3B 6U8
⊖UHF OSC V1 6AF4A
UHF Tuner Power Plug & Socket
FINE TUNING
(IF OUTPUT) To TV Chassis M
To TV Chassis K
(RF AGC) To TV Chassis N
215V
185V
Gimmick
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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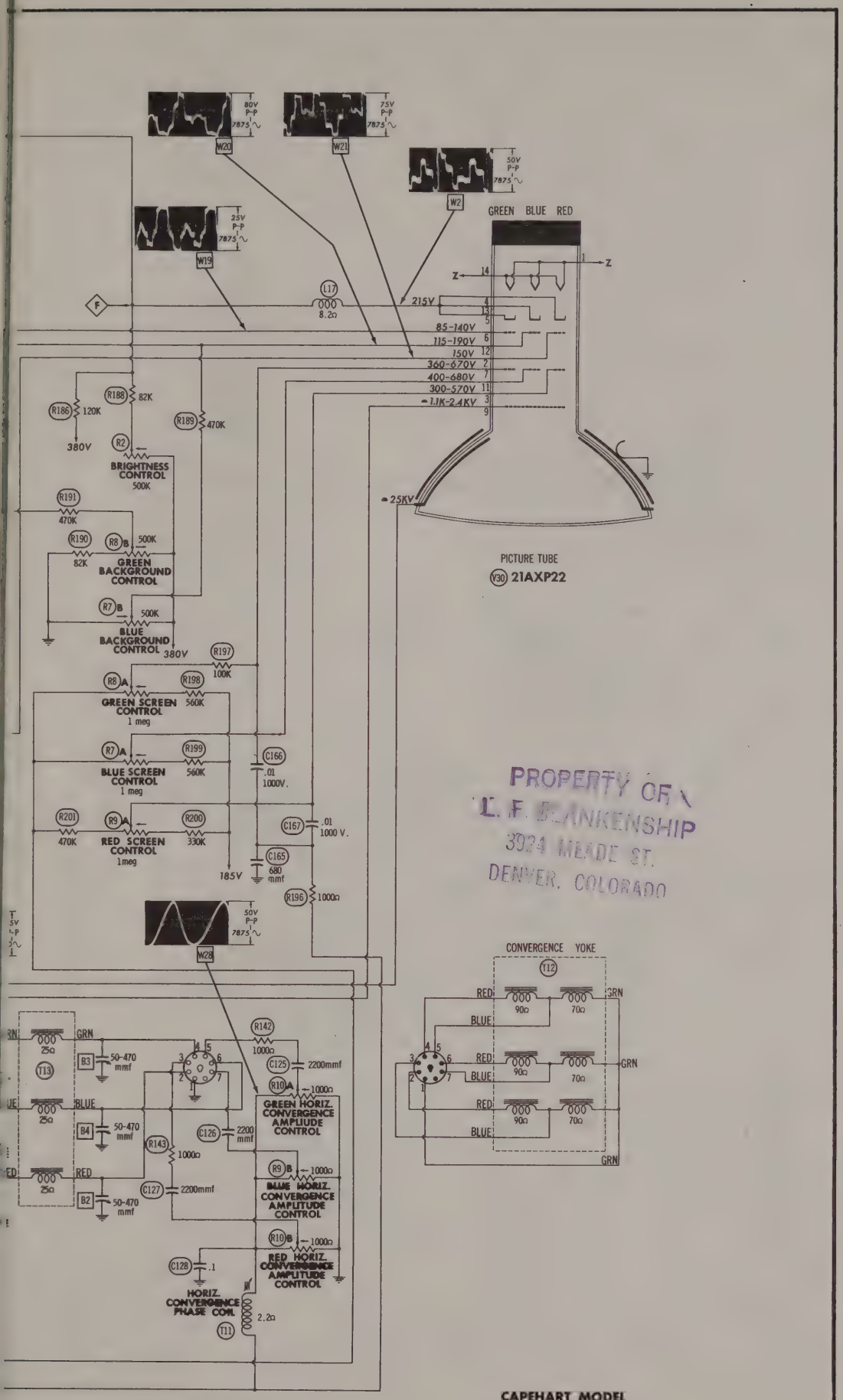
TUNER SCHEMATIC



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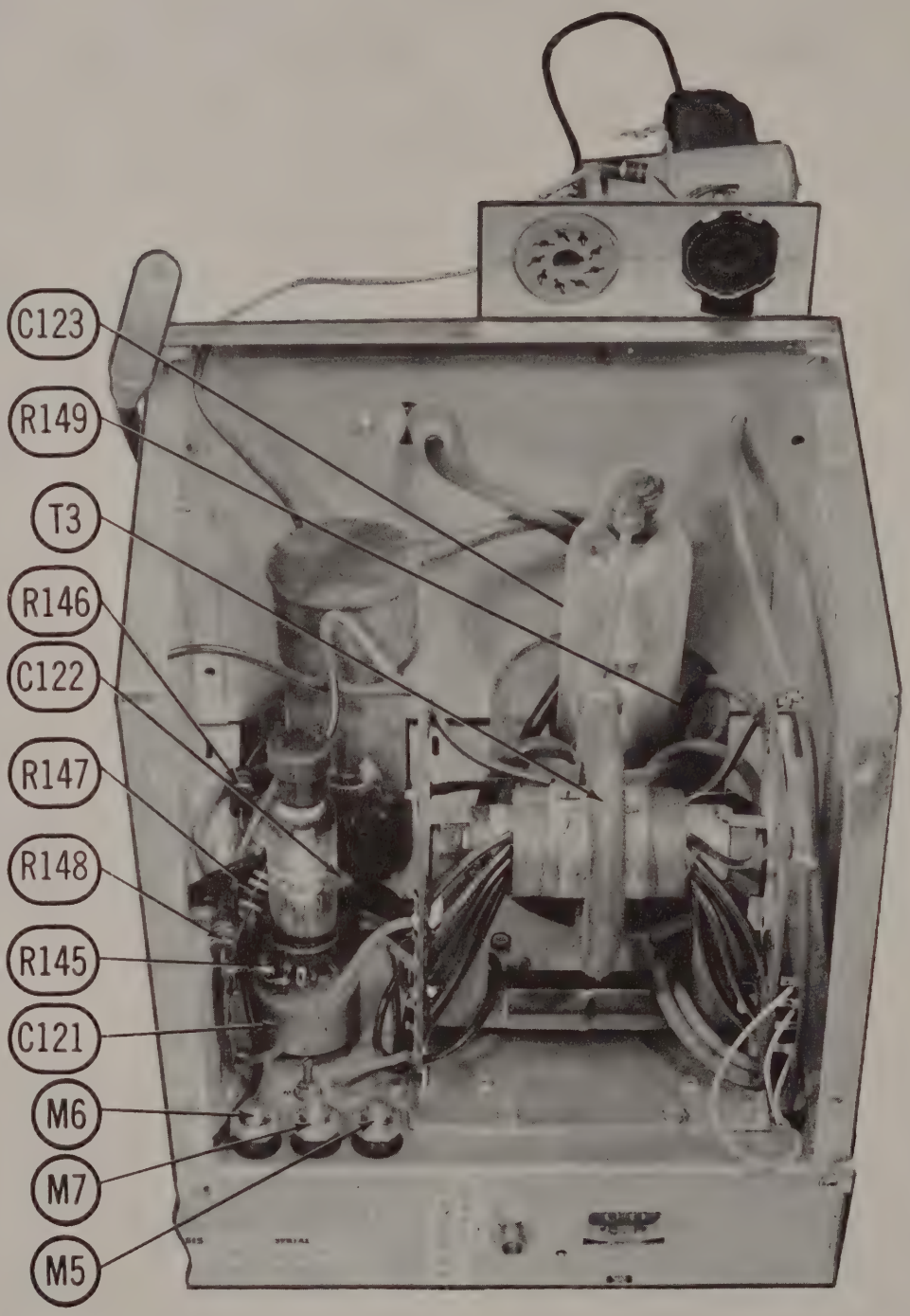
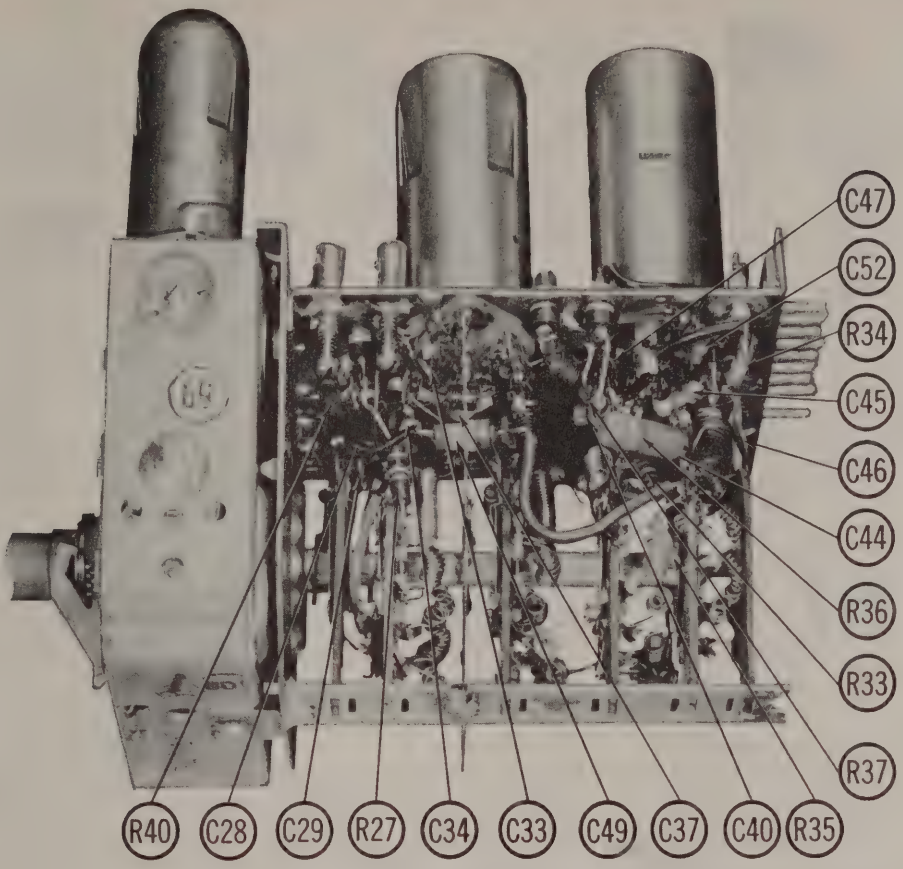
CAPEHART MODEL
31T216M-5 (Ch. CXC-13)

CAPEHART MODEL
31T216M-5 (Ch. CXC-13)



HIGH VOLTAGE COMPARTMENT



RF TUNER-RIGHT SIDE

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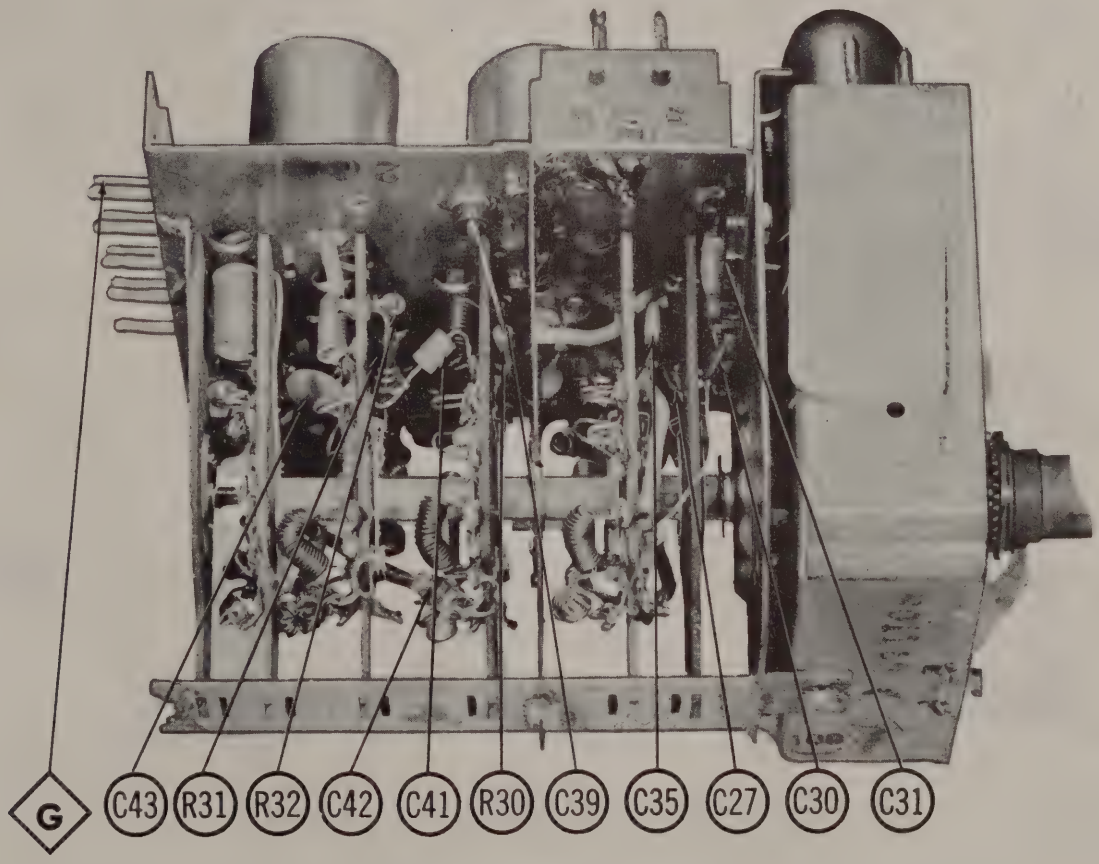
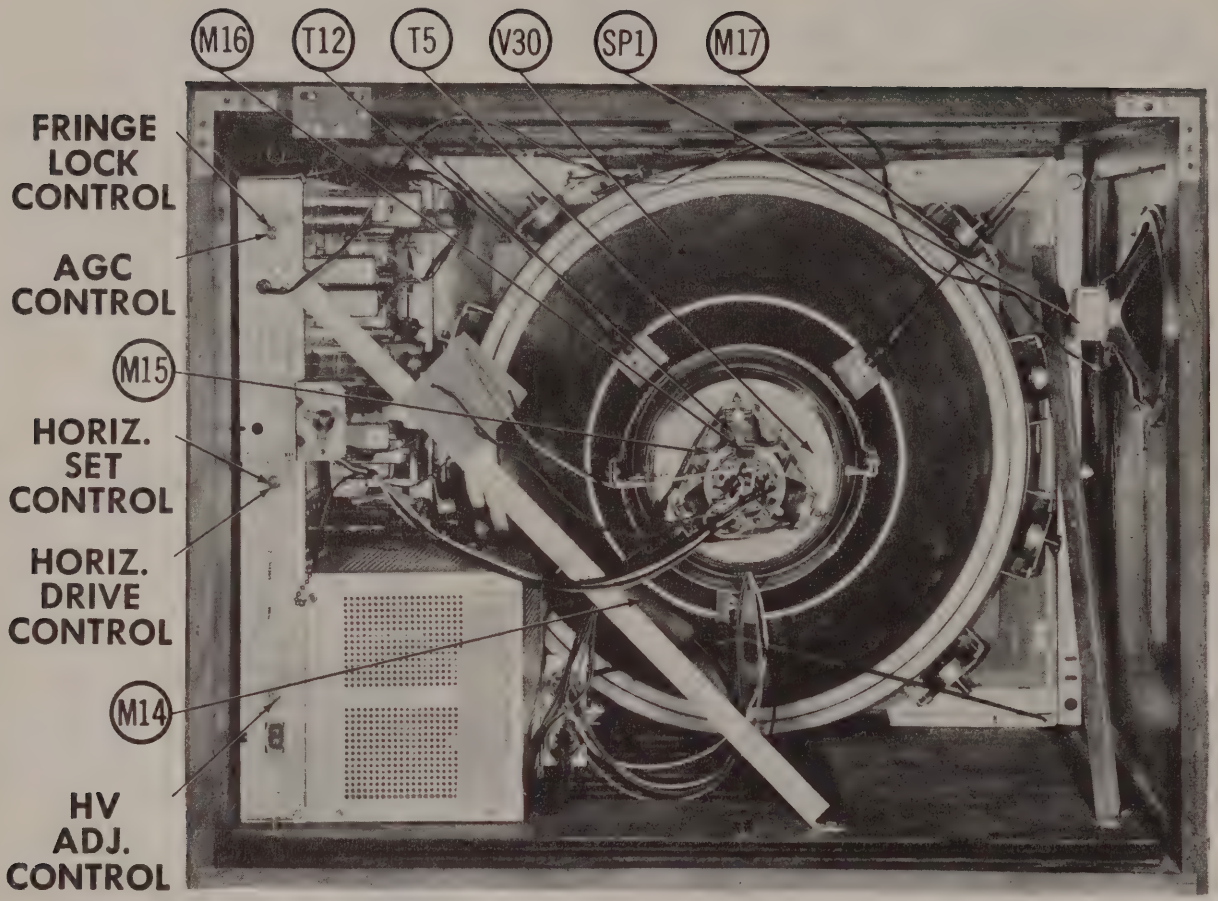


RF TUNER-LEFT SIDE



CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 12 push-on type control knobs from front panel of cabinet.
2. Remove 10 wood screws and 1 metal screw. Remove rear cover.
3. Remove 4 mounting board bolts and 2 picture tube bracket bolts at the inside front of cabinet.
4. Remove speaker leads, remove 4 speaker nuts. Remove speaker.
5. Remove chassis and picture tube assembly from cabinet.

PICTURE TUBE REMOVAL

1. Remove chassis and picture tube assembly from cabinet on mounting board as outlined above.
2. Remove blue beam positioning magnet and purity magnet assembly.
3. Remove ground wire between yoke and convergence coil.
4. Loosen 3 metal screws holding convergence coil and magnet asembly; remove from neck of picture tube.
5. Lay picture tube assembly face down on a soft surface and loosen 3 thumb screws holding retaining ring. Remove retaining ring assembly from picture tube.
6. Remove 1 screw holding equalizing magnets on front of picture tube. Remove from picture tube.
7. Remove insulating shield and remove picture tube from mask.

DUMONT MODEL RA345

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DUMONT MODEL RA345

DUMONT MODEL RA345

TRADE NAME	Dumont Model RA-345
MANUFACTURER	Allen B. Dumont Laboratories, Inc., 2 Main St., Passaic, N.J.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Four)	Types 6C4 Preamplifier, 12AX7 AF Amp.-Phase Inv., (2) 50C5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .36 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR CRESCENT 500 SERIES - PHOTOFACT SET 197 — FOLDER 4 OR RECORD CHANGER MANUAL CM-5.

SPEAKER REMOVAL

1. Open cabinet lid. Remove 4 wood screws from inside top front of cabinet.
2. Remove 3 wood screws below record changer base at front of cabinet.
3. Remove 5 wood screws at lower front of speaker enclosure.
4. Tilt front of cabinet and remove speakers.

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PARTS LIST AND DESCRIPTIONS

DUMONT
Model RA-345

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	6C4	
V2	AF Amplifier-Phase Inv.	12AX7	
V3	Output	50C5	
V4	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DUMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150		PRS150V8040	BBRT84215	TCT3117	TDLT-7	FMT-315	TVA-3455
B	60	150		-20	BR2015	TC45	TD-20-150	FM-1550	TVA-1410
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA DUMONT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C3	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C5	.01	200		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C6	.047	200		BPD-05	DF-203	CUB2S47		PT4147	2TM-S47	
C7	68			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C8	.01	200		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C9	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C10	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C11	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C12	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C13	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DUMONT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	01011181	B-75	A47-2Meg-S	Q11-139	U-56	Base
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	1Meg	½	01058362	BT-73-S	A47F4-1Meg	Q19-137X	UT438	Volume-tapped @ 350K
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
C	Switch	1	Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R2A
R3A	1Meg	½	01011182	B-69	A47-1Meg-S	Q11-137	U-54	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

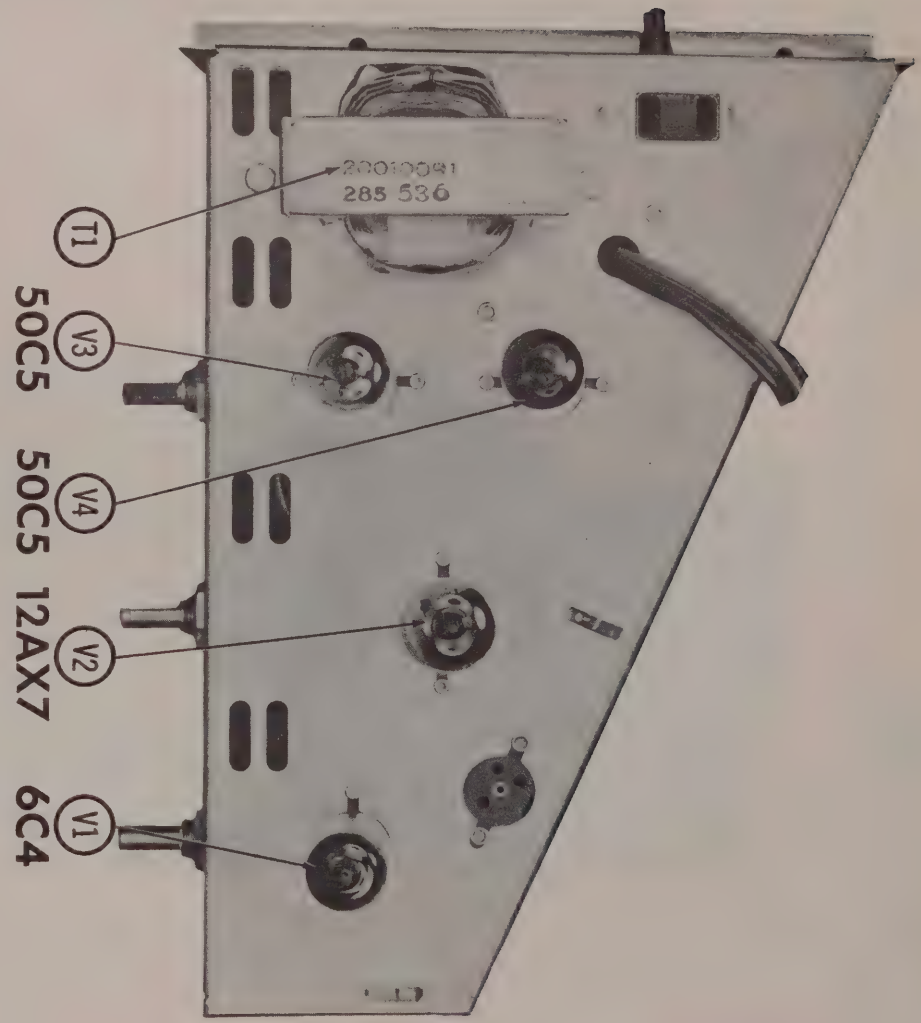
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DUMONT PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R4	150KΩ 5%			BTS-150K	
R5	220KΩ			BTS-220K	
R6	22KΩ			BTS-22K	
R7	3900Ω			BTS-3900	
R8	22KΩ			BTS-22K	
R9	51KΩ 5%			BTS-51K 5%	
R10	3300Ω			BTS-3300	
R11	51KΩ 5%			BTS-51K 5%	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DUMONT PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R12	2200Ω			BTS-2200	
R13	390KΩ			BTS-390K	
R14	33KΩ			BTS-33K	
R15	470KΩ			BTS-470K	
R16	1000Ω	2		BTB-1000	
R17	82Ω	1		BTA-82	
R18	6200Ω 5%			BTS-6200 5%	
R19	12Ω	2			

CHASSIS—TOP VIEW



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PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3.7KΩ	3-4Ω	20010091	Z1007 ①	A-2905 ①	A-3830	22S60	S-55X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA: DUMONT PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	10"	PM	3-4Ω	18003851	10A10XZ3.2	237S1	
SP2	3½"	PM	14Ω	18003781	3A15T		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA: DUMONT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.100A	26001931	1005A	RS150	6S150	5P1	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: DUMONT PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2				46-T	0-1 or S-1	

ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

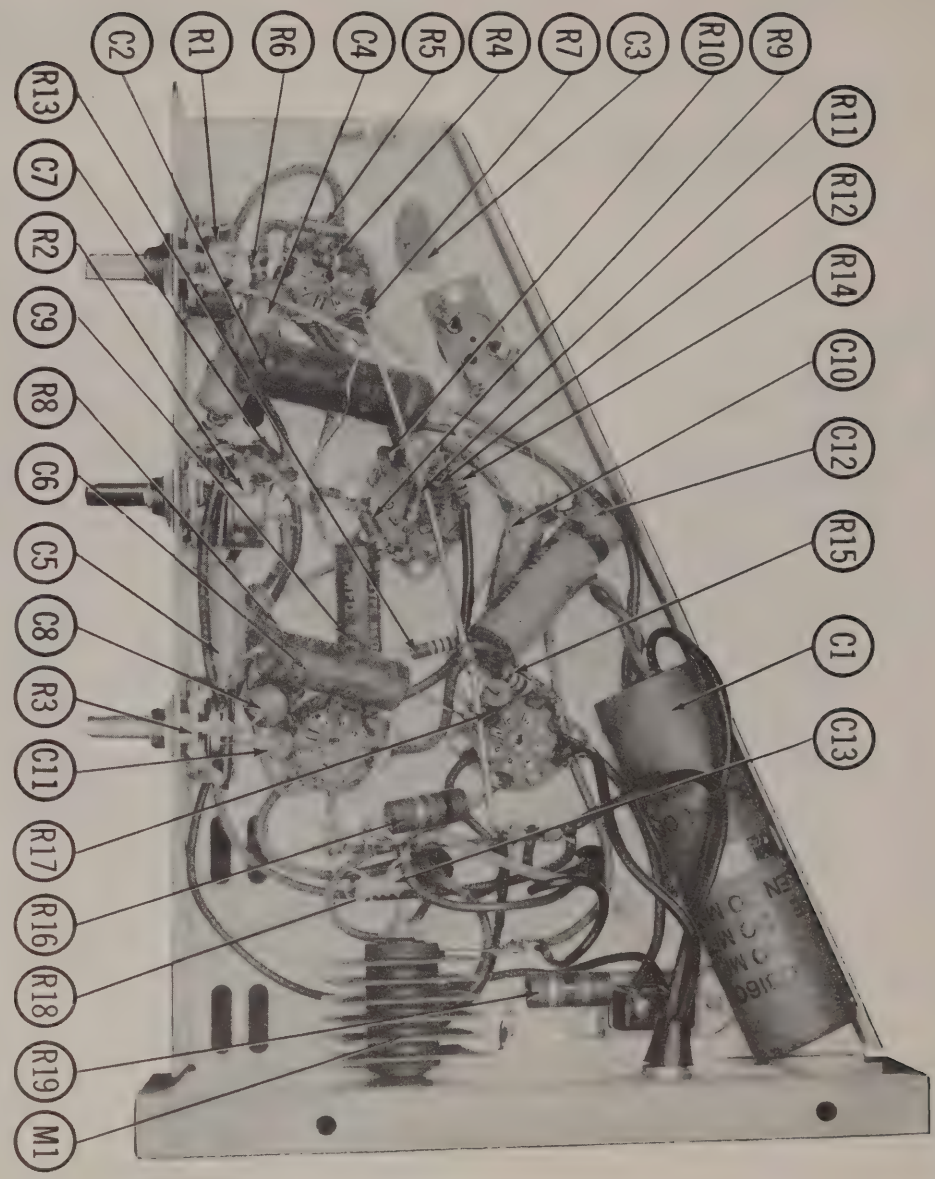
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

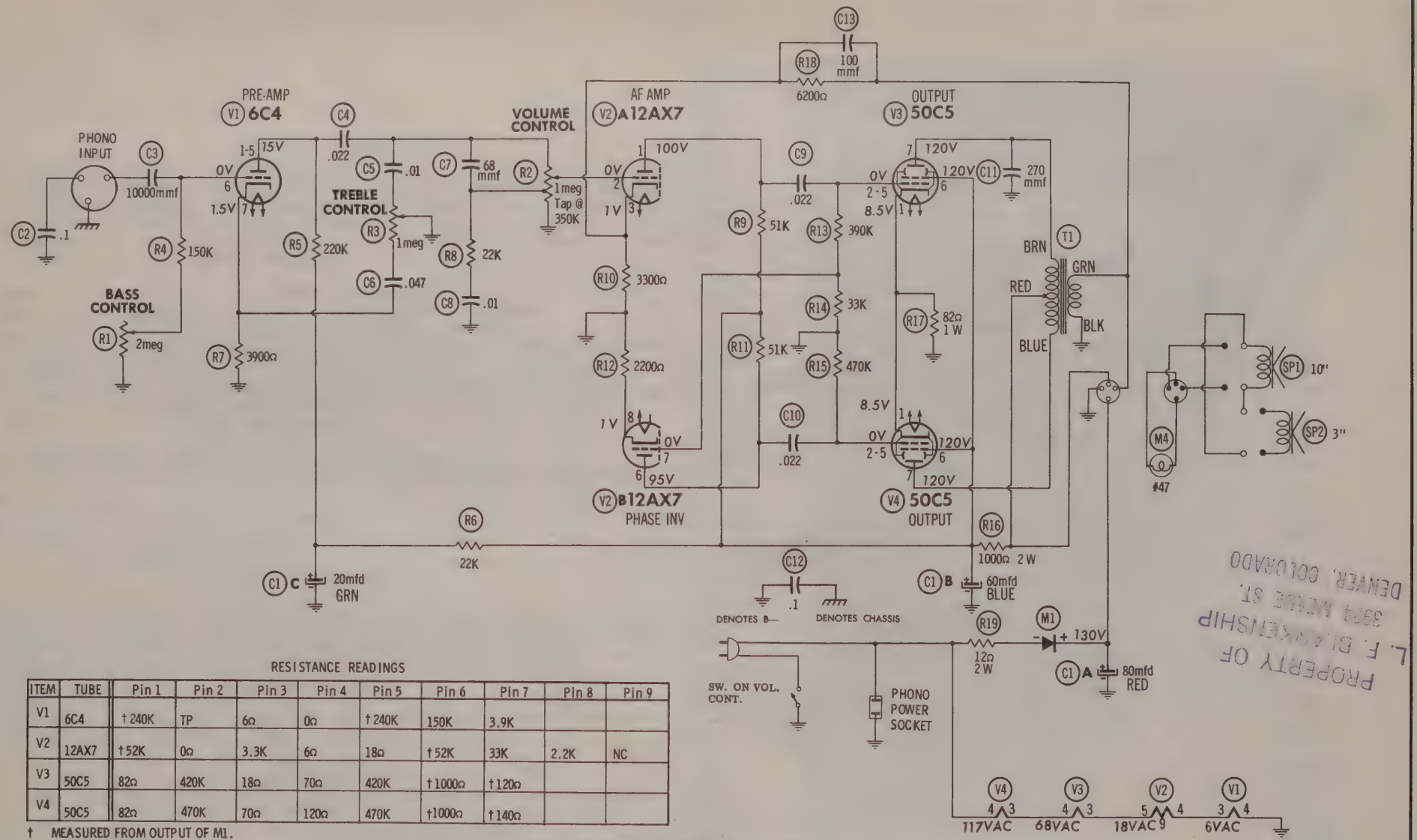
ITEM No.	REPLACEMENT DATA: DUMONT PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M3	78RPM Needle	†CR-55 or ♦CR-55D	†C-449 or ♦C-449D	†W-64S or ♦W-64D	† Jewel ♦ Diamond
	33 1/3-45RPM Needle	†CR-55LP or ♦CR-55LPD	†A-448 or ♦A-448D	†W-64MGS or ♦W-64MGD	

MISCELLANEOUS

ITEM No.	PART NAME	DUMONT PART No.	NOTES
M4	Pilot Light		#47

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6C4	†240K	TP	6Ω	0Ω	†240K	150K	3.9K		
V2	12AX7	†52K	0Ω	3.3K	6Ω	18Ω	†52K	33K	2.2K	NC
V3	50C5	82Ω	420K	18Ω	70Ω	420K	†1000Ω	†120Ω		
V4	50C5	82Ω	470K	70Ω	120Ω	470K	†1000Ω	†140Ω		

† MEASURED FROM OUTPUT OF M1.
TP TIE POINT.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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MOTOROLA MODELS 46HF1, B, BD, D (Ch. HS-495)

MOTOROLA MODELS 46HF1, B, BD, D (Ch. HS-495)

TRADE NAME	Motorola Models 46HF1, B, BD, D (Ch. HS-495)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AX7 AF Amp.-Phase Inv., (2) 50C5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .31 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER C5RC USED IN MODELS 46HF1, B-SEE SIMILAR CRESCENT 500 SERIES-PHOTOFACT SET 197-FOLDER 4 OR RECORD CHANGER MANUAL CM-5.
FOR SERVICE INFORMATION ON RECORD CHANGER VM7RC USED IN MODELS 46HF1BD, D-SEE SIMILAR V-M MODEL 954B-PHOTOFACT SET 302-FOLDER 12.

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G393

DATE 8-56 SET 327 FOLDER 5

PARTS LIST AND DESCRIPTIONS

MOTOROLA
Model 46HF1 (Ch. HS-495)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Output	50C5	
V3	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 40	150	23B632092	AFH3-10	C009	FP311.5	TMT-9	T-045	TVL-3440
B	▲ 40	150							
C	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		21R482726	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C3	3300		21R120422	BPD-0033	DD-332	K077	811-0033	UC-5233	5HK-D33	
C4	10000		21R482726	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	3300		21R120422	BPD-0033	DD-332	K077	811-0033	UC-5233	5HK-D33	
C6	.05	400	8R121567	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C7	.02	400	8R121770							
C8	.05	400	8R121567	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C9	4700		21R120422	BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C10	.15	200	8R122258	P288N-15		CUB2P15		PT4015	2TM-P15	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	3Meg	½	18A634505			Q18-140X	UT-457	Volume-Tapped at 1Meg
R2A	3Meg	½	18A634506	B-85	A47-3Meg-Z	Q13-140	U-57	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	1Meg	½	18K634834	B-70	A47-1Meg-Z	Q13-137	U-53	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R4	39K		6R6487	BTS-39K	
R5	68K		6R6074	BTS-68K	
R6	6.8Meg		6R3987	BTS-6.8Meg	
R7	220K		6R6407	BTS-220K	
R8	820Ω		6R6269	BTS-820	
R9	470K		6R6377	BTS-470K	
R10	220K		6R6407	BTS-220K	
R11	820Ω		6R6269	BTS-820	
R12	220K		6R6407	BTS-220K	

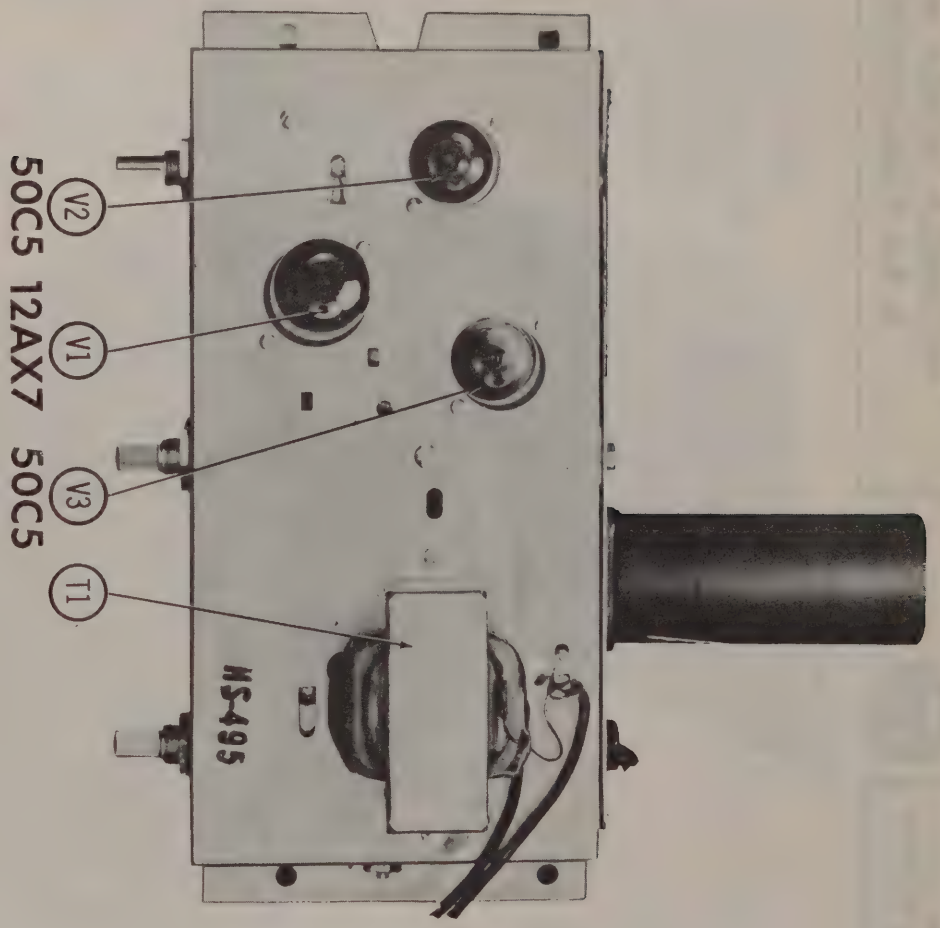
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R13	6800Ω		6R6428	BTS-6800	
R14	220K		6R6407	BTS-220K	
R15	82Ω		6R2035	BTS-82	
R16	1800Ω		6R2089	BTS-1800	
R17	4700Ω		6R6080	BTS-4700	
R18	22Ω	5	65B630362		
R19	82Ω	2			Note 1
R20	68K		6R6074	BTS-68K	

Note 1. Some versions use an 82Ω 5W wire wound resistor in this application (Part No. 17K634893).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3.8KΩ	2.4Ω	25C634503	Z1006	A-2901	A-3852	24S61	S-53X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6½"	PM	3.4Ω	50C634473	6A15	224S1	
SP2	4"	PM	6.6Ω	50B634504	4A1Z6.6		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MOTOROLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.089A	48K482807	1005A	RS150	6S150	5P1	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	720022	55-T	GD-J	47	0-1 or S-1	

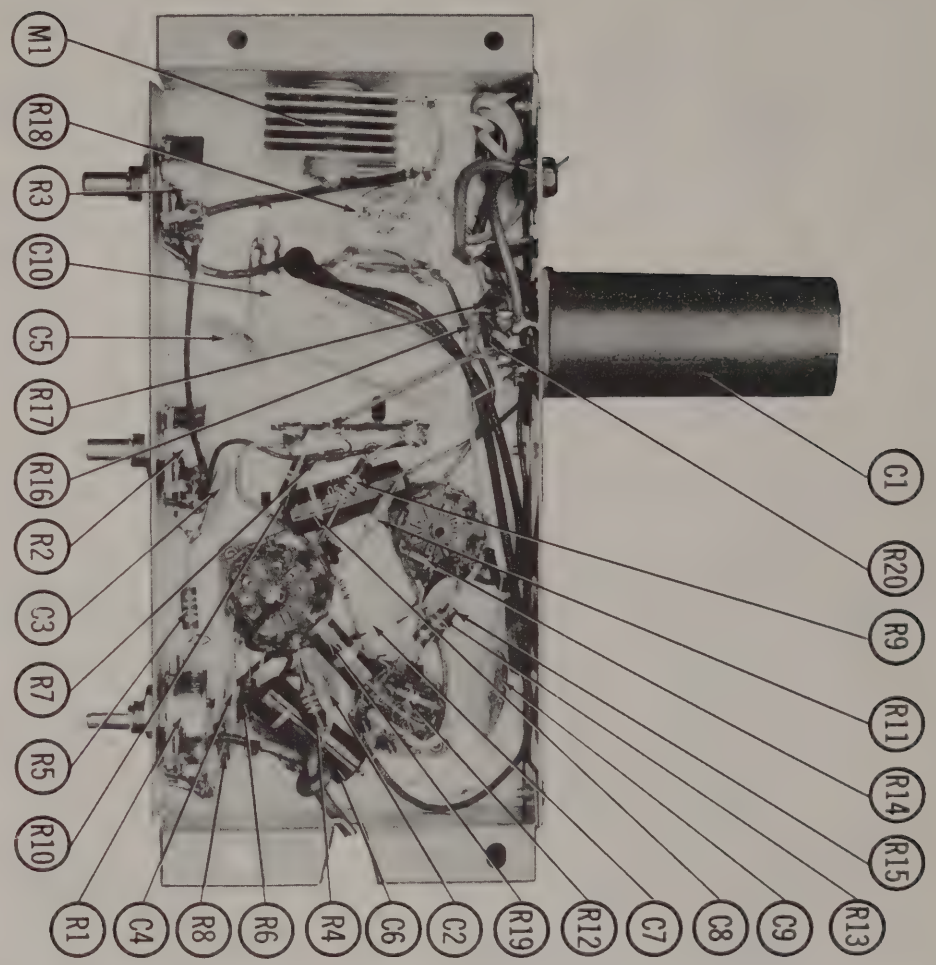
ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

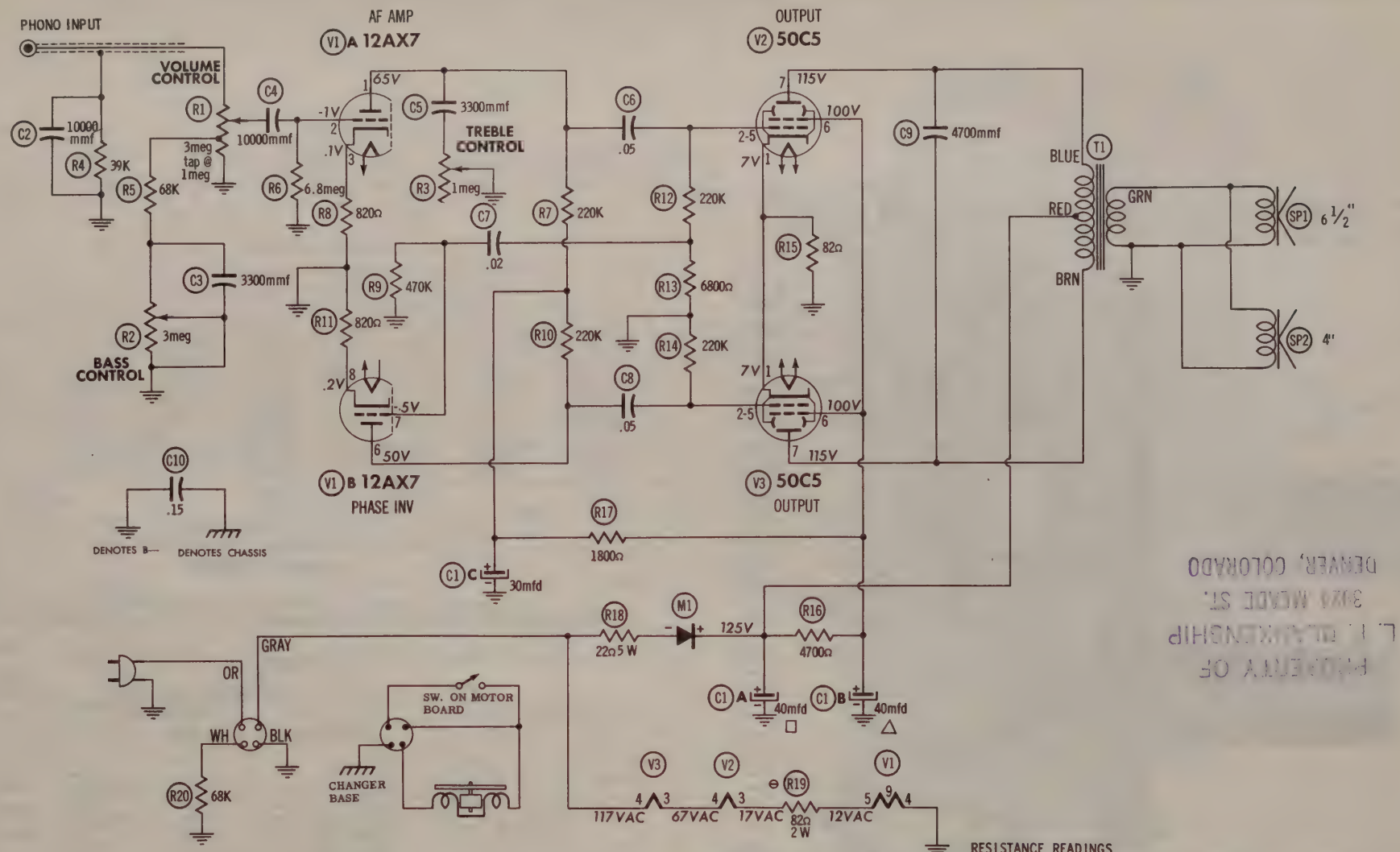
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	MOTOROLA PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M3		* A-67 or † S-66 or ◆† S-66SD or ◆ S-66D	† AC-434 or ◆† AC-434D1 or †◆ AC-434D2 or ◆ AC-434D	† W-75TPS or ◆† W-75DS or ◆ W-75TPD	* Metal † Jewel ◆ Diamond

CHASSIS—BOTTOM VIEW



MOTOROLA
Model 46HF1 (Ch. HS-495)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†226KΩ	6.8meg	820Ω	0Ω	12Ω	†226KΩ	470KΩ	820Ω	NC
V2	50C5	82Ω	227KΩ	94Ω	144Ω	227KΩ	†4.7KΩ	†210Ω		
V3	50C5	82Ω	220KΩ	144Ω	194Ω	220KΩ	†4.7KΩ	†160Ω		

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

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OLYMPIC MODELS C21BG15, 16, C24BH22, 24, K21BG12, 13, 14, K24BH31, 32, 33, T21BG10 (Ch. BG, BH & Radio Model 110)

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OLYMPIC MODEL K21BG12

TRADE NAME	Olympic	MODELS	CHASSIS
		C21BG15, C21BG16, K21BG12, K21BG13, K21BG14, T21BG10	BG And AM Radio Model 110
		C24BH22, C24BH30, K24BH31, K24BH32, K24BH33	BH And AM Radio Model 110

MANUFACTURER Olympic Radio & Television, Inc., 34-01 38th. Ave., Long Island City 1, N.Y.
TYPE SET TV-Radio-Phono Combination Receiver
TUBES Eighteen (TV), Five (Radio)
POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.42 Amp. @ 117 Volts AC
TV TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)
RADIO TUNING RANGE 540-1620KC, AM IF 455KC

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Schematic (TV) 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

FOR SERVICE INFORMATION ON RECORD CHANGER MODEL V-M 954B, SEE PHOTOFACT SET 302, FOLDER 12.

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DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from front panel of cabinet.

2. Remove 2 metal screws. Remove rear cover.

3. Remove speaker plug.

4. Remove 4 chassis bolts. Remove chassis.

RADIO CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove speaker plugs, TV power plug, phono motor plug and phono plug.

3. Remove 3 chassis bolts. Remove chassis.

SPEAKER REMOVAL

1. Remove 4 speaker nuts. Remove speaker.

MODEL K21BG12 And Radio Model 110

OLYMPIC MODELS C21BG15, 16, C24BH22, 24, K21BG12, 13, 14, K24BH31, 32, 33, T21BG10 (Ch. BG, BH & Radio Model 110)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator adjustments, it is necessary to remove the chassis from the cabinet. (See Disassembly Instructions).

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding wood molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control (R7) for maximum volume and minimum buzz.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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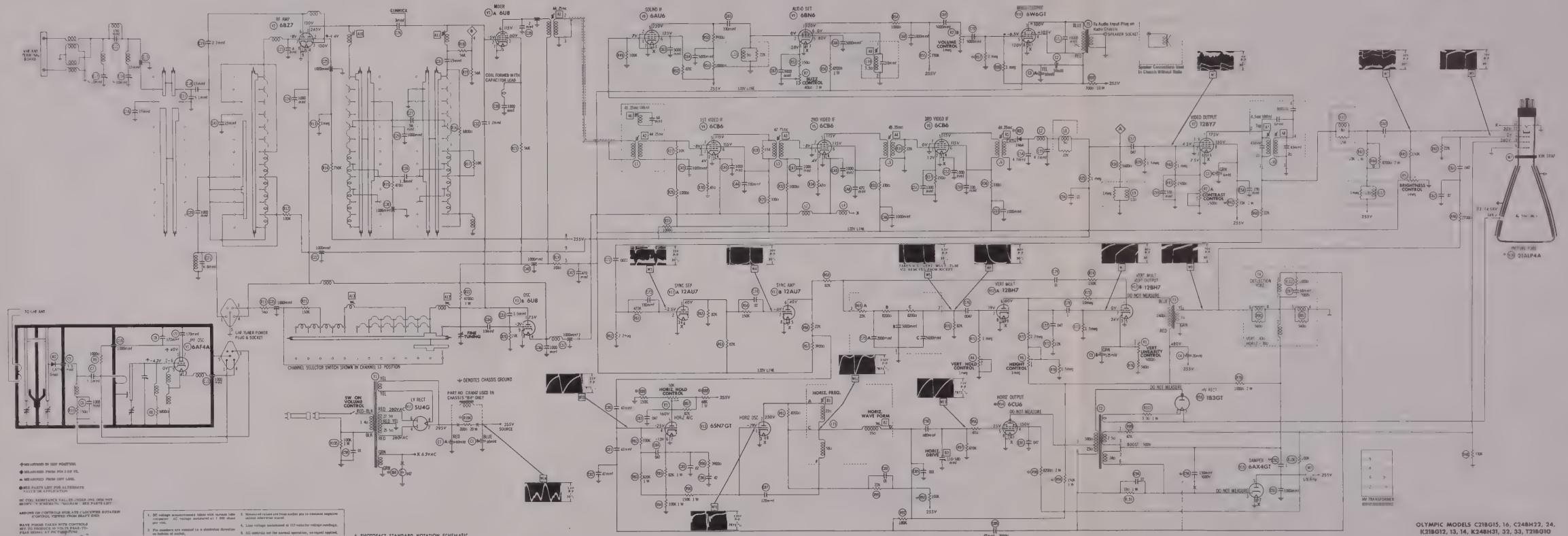
OLYMPIC MODELS C218G15, 16, C248H22, 24,
K218G12, 13, 14, K248H31, 32, 33, T218G10
(Ch. 8G, 8H & Radio Model 110)
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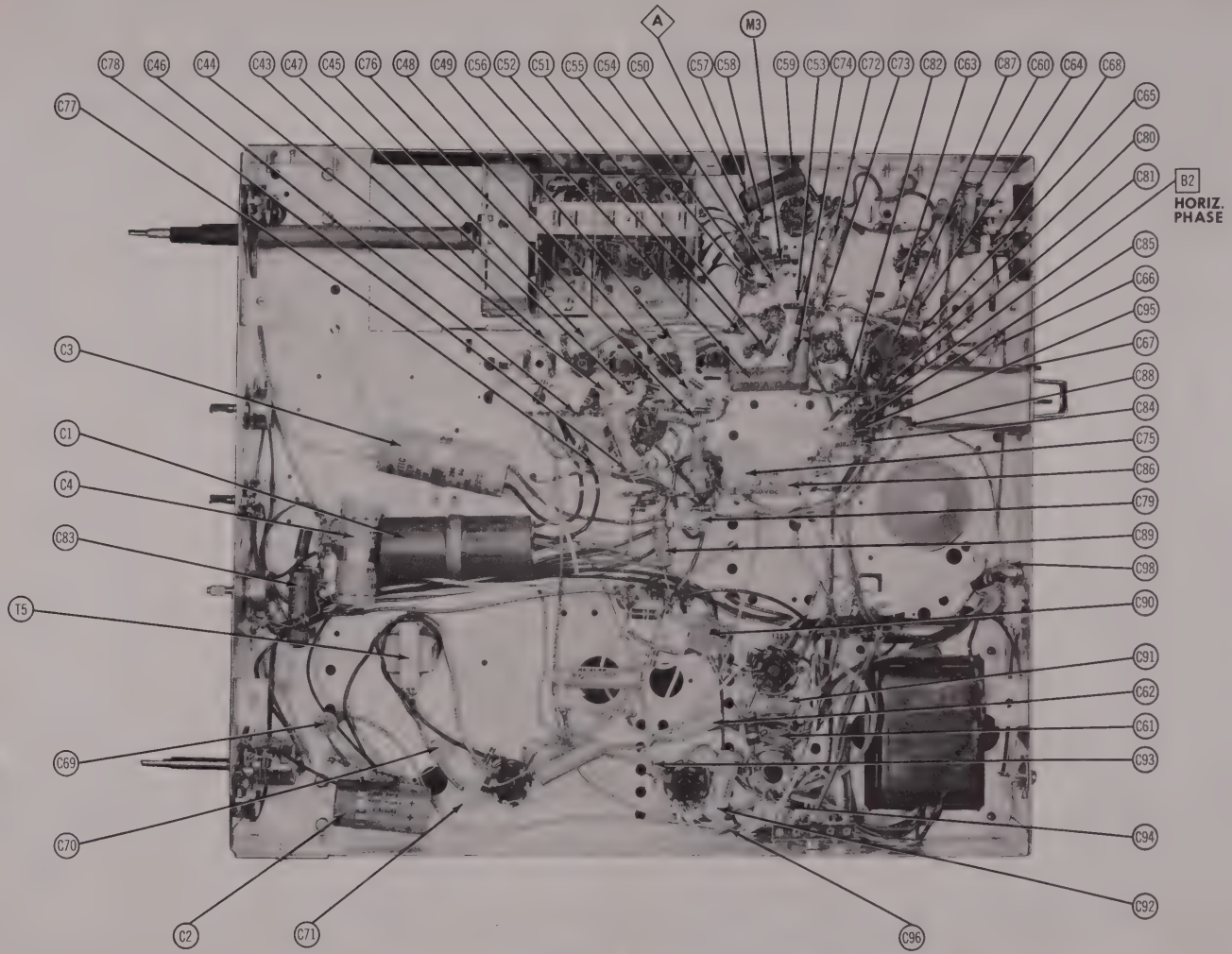

TV CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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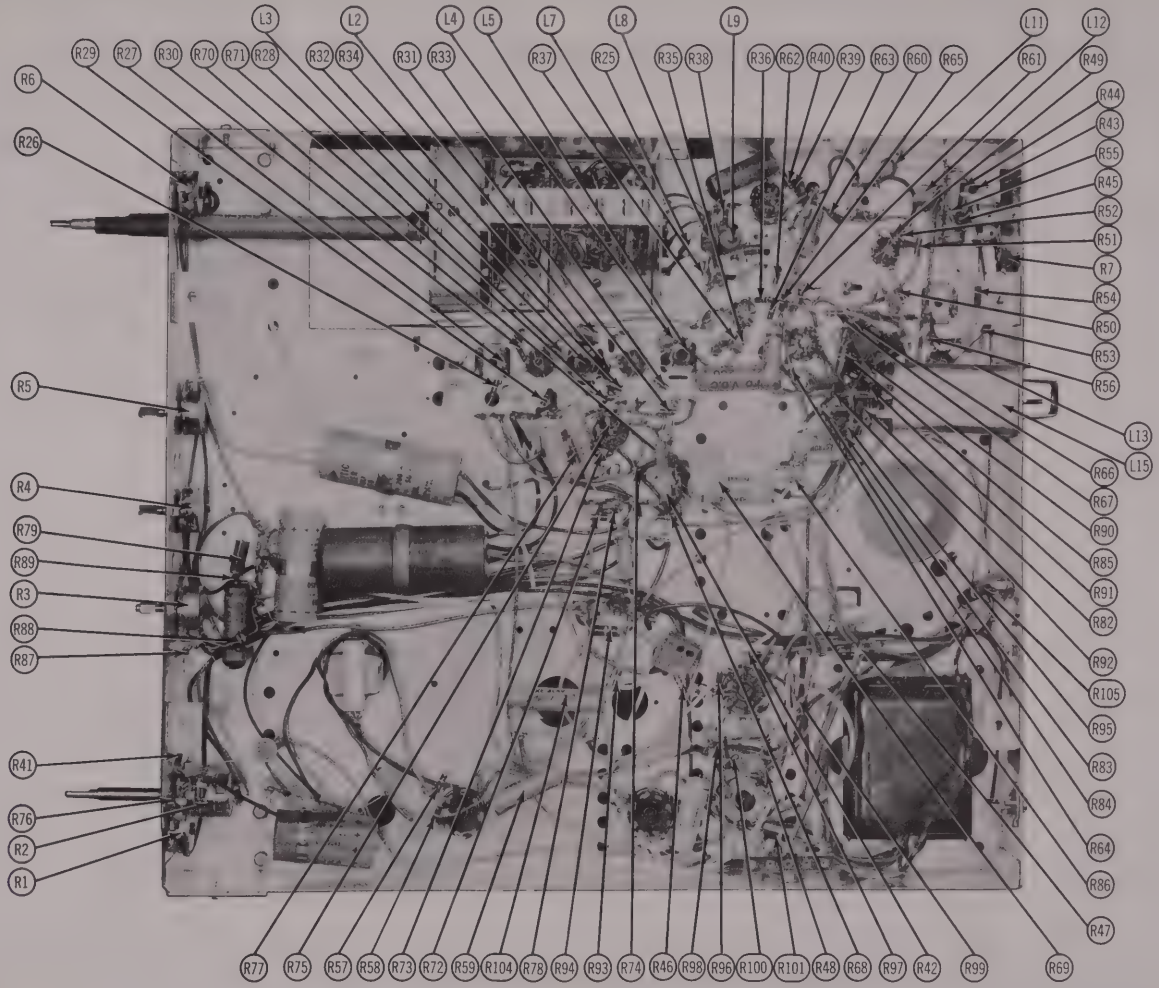
OLYMPIC MODELS C21BG15, 16, C24BH22, 24, K21BG12, 13, 14, K24BH31, 32, 33, T21BG10 (Ch. BG, BH & Radio Model 110)



TV CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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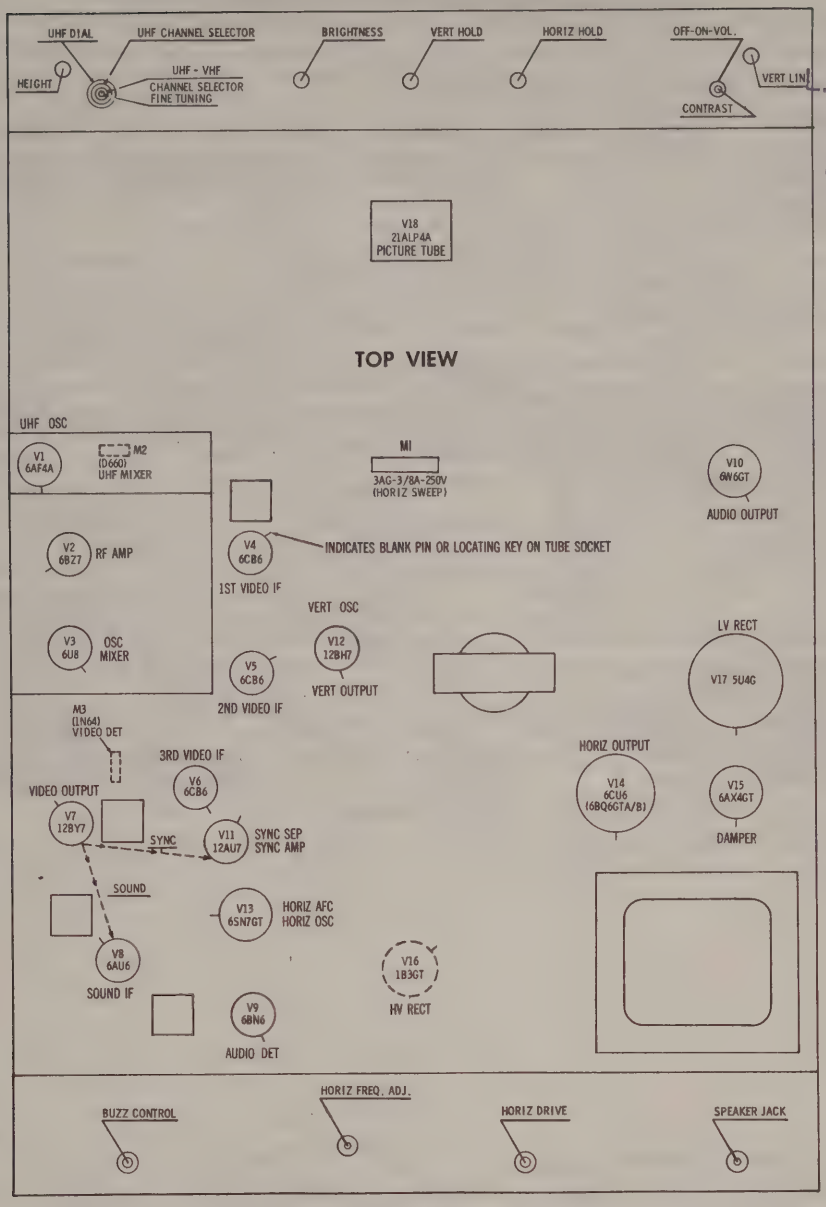
TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V10 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V18
Has pic, no sound - V8, V9, V10

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V11, V13
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound -V13, V14, V15, V16, V18, Fuse (M1)
No vertical deflection - V12
Poor vert. linearity or foldover - V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V11, V12
Horiz. off freq. -V11, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V13) to disable the high voltage.

VIDEO IF ALIGNMENT

Use only enough generator output to provide useable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube. Low side to chassis.	44.25MC	9	DC probe thru 100KΩ to point (A). Common to chassis.	A1, A2	Use only enough generator output to provide useable indication on VTVM. Adjust for maximum deflection.
2.	"	"	42.75MC	"	"	A3	"
3.	"	"	45.25MC	"	"	A4	"
4.	"	"	44.25MC	"	"	A5	"
5.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Use only enough sweep generator output to provide useable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over converter tube. Low side to chassis.	44.25MC (10MC Swp.)	41.25MC 42.5MC 44.1MC 45.7MC	9	Vert. amp. thru detector probe (Fig.1) to pin 1 (grid) of 6CB6 (V5). Low side to chassis.		Check for response curve similar to Fig. 2 with markers positioned as indicated. If necessary retouch A1 and A2 to obtain desired response.
7.	"	"	"	41.25MC 42.5MC 45.75MC	9	Vert. amp. thru 100KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 3 with markers as shown. If necessary, retouch A3, A4 and A5 to obtain desired response.

4.5MC TRAP ALIGNMENT

Set the contrast control for maximum contrast.
Remove 6CB6 (V6) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Common to chassis.	A7	Adjust for MINIMUM deflection. Use maximum signal generator output. Replace V6 in its socket.

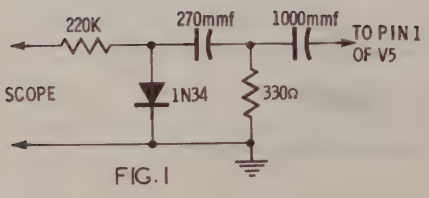

FIG. 1

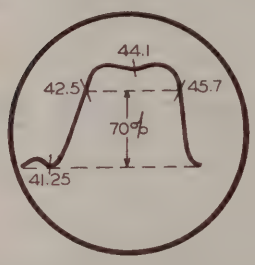

FIG. 2

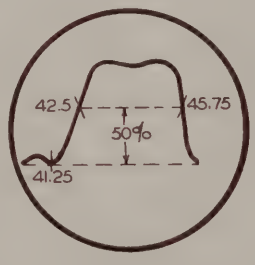

FIG. 3

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ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Connect the DC probe of the VTVM to pin 2 (grid) of the 6BN6 (V9), common to chassis. Turn the set on and tune in a strong TV signal. Adjust A8 for maximum deflection on the VTVM. Disconnect the VTVM from the receiver. Set the buzz control (R7) to its mid-range position. Adjust the quadrature coil slug (A9) for maximum volume. Adjust R7 for maximum volume and MINIMUM buzz. Retouch A8 for maximum volume.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C56. Connect the positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211.25MC 215.75MC	13	Vert. amp. thru 10KΩ to point (B). Low side to chassis.	A10, A11	Adjust for response curve similar to Fig. 5 with markers above 90%.

VHF OSCILLATOR ALIGNMENT

Leave bias connected as under "UHF RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211.25MC 215.75MC	13	Vert. amp. thru 50K to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should fall at 50%.
11.	"	"	85MC (10MC Swp.)	83.25MC 87.75MC	6	"	A13	"

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RADIO ALIGNMENT

Remove radio chassis from cabinet.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
12.	.1MFD	High side to antenna lug on tuning gang. Low side to B- thru a .1MFD capacitor.	455KC (400~ Mod.)	Radio	Tuning gang fully open	Across Voice Coil	A14, A15, A16, A17	Adjust for maximum output.
13.		Loop	1500KC	"	Tune to 1500KC signal	"	A18	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
14.		"	"	"	"	"	A19	"

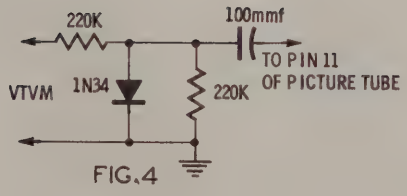


FIG.4

FIG.5

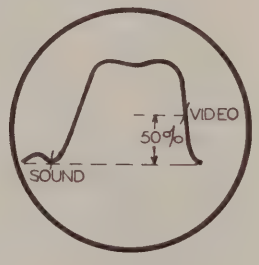


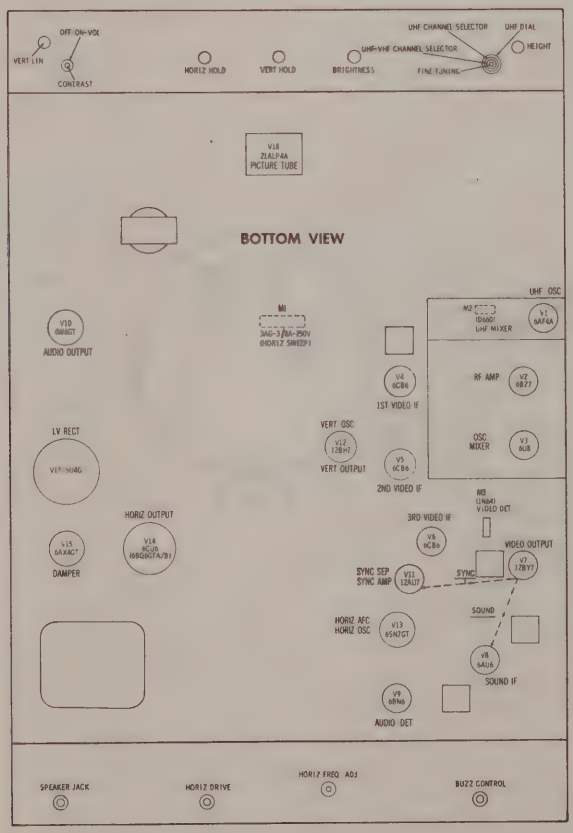
FIG.6

OLYMPIC MODELS C21BG15, 16, C24BH22, 24, K21BG12, 13, 14, K24BH31, 32, 33, T21BG10 (Ch. BG, BH & Radio Model 110)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	*# 5.8KΩ	6.8KΩ	.1Ω	0Ω	0Ω	6.8KΩ	*# 5.8KΩ		
V2	6BZ7	† 700Ω	400KΩ	INF	.1Ω	0Ω	INF	1Meg	0Ω	0Ω
V3	6U8	# 4.8KΩ	100Ω	# 56KΩ	.1Ω	0Ω	# 100Ω	0Ω	0Ω	15KΩ
V4	6CB6	1Meg	47Ω	0Ω	.1Ω	#330Ω	# 330Ω	0Ω		
V5	6CB6	1Meg	47Ω	0Ω	.1Ω	# 330Ω	# 330Ω	0Ω		
V6	6CB6	.1Ω	150Ω	0Ω	.1Ω	# 330Ω	# 330Ω	0Ω		
V7	12BY7	350Ω	550KΩ	0Ω	0Ω	0Ω	.1Ω	† 5KΩ	† 33KΩ	0Ω
V8	6AU6	100KΩ	0Ω	.1Ω	0Ω	† 5KΩ	† 47KΩ	0Ω		
V9	6BN6	350Ω	5Ω	.1Ω	0Ω	# 4.7KΩ	3.5Ω	† 330KΩ		
V10	6W6GT	0Ω	0Ω	† 1KΩ	† 900Ω	500KΩ	NC	.1Ω	50KΩ	
V11	12AU7	# 50KΩ	2.5Meg	0Ω	.1Ω	.1Ω	# 20KΩ	200KΩ	0Ω	0Ω
V12	12BH7	▪ 2.6KΩ	1.5Meg	2KΩ	0Ω	0Ω	▪ 2.2Meg	1.5Meg	0Ω	.1Ω
V13	6SN7GT	480KΩ	† 70KΩ	0Ω	1.5Meg	† 60KΩ	400KΩ	0Ω	.1Ω	
V14	6CU6	TP	0Ω	NC	† 8.5KΩ	470KΩ	TP	.1Ω	0Ω	TOP CAP ▪ 44Ω
V15	6AX4GT	NC	NC	300KΩ	NC	† 200Ω	NC	.1Ω	0Ω	
V16	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TOP CAP ▪ 625Ω
V17	5U4G	NC	40KΩ	TP	26Ω	TP	28Ω	NC	40KΩ	
V18	21ALP4A	0Ω	22KΩ	PIN 6 0Ω	PIN 10 ▪ 50KΩ	PIN 11 # 400KΩ	PIN 12 .1Ω			

\# MEASURED FROM 120V LINE.
* MEASURED IN "UHF" POSITION.
† MEASURED FROM PIN 2 OF V17.
▪ MEASURED FROM PIN 3 OF V15.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART

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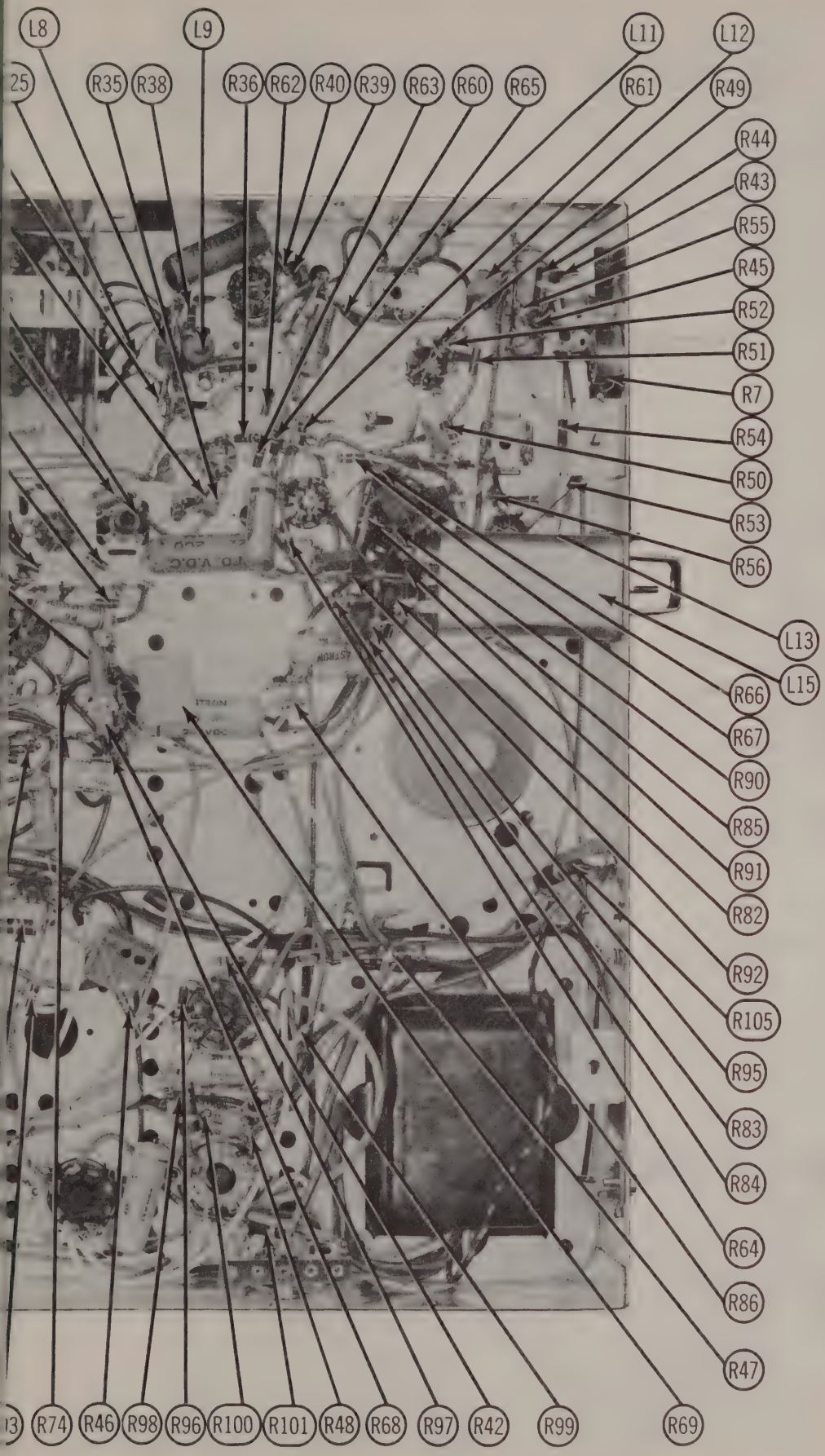
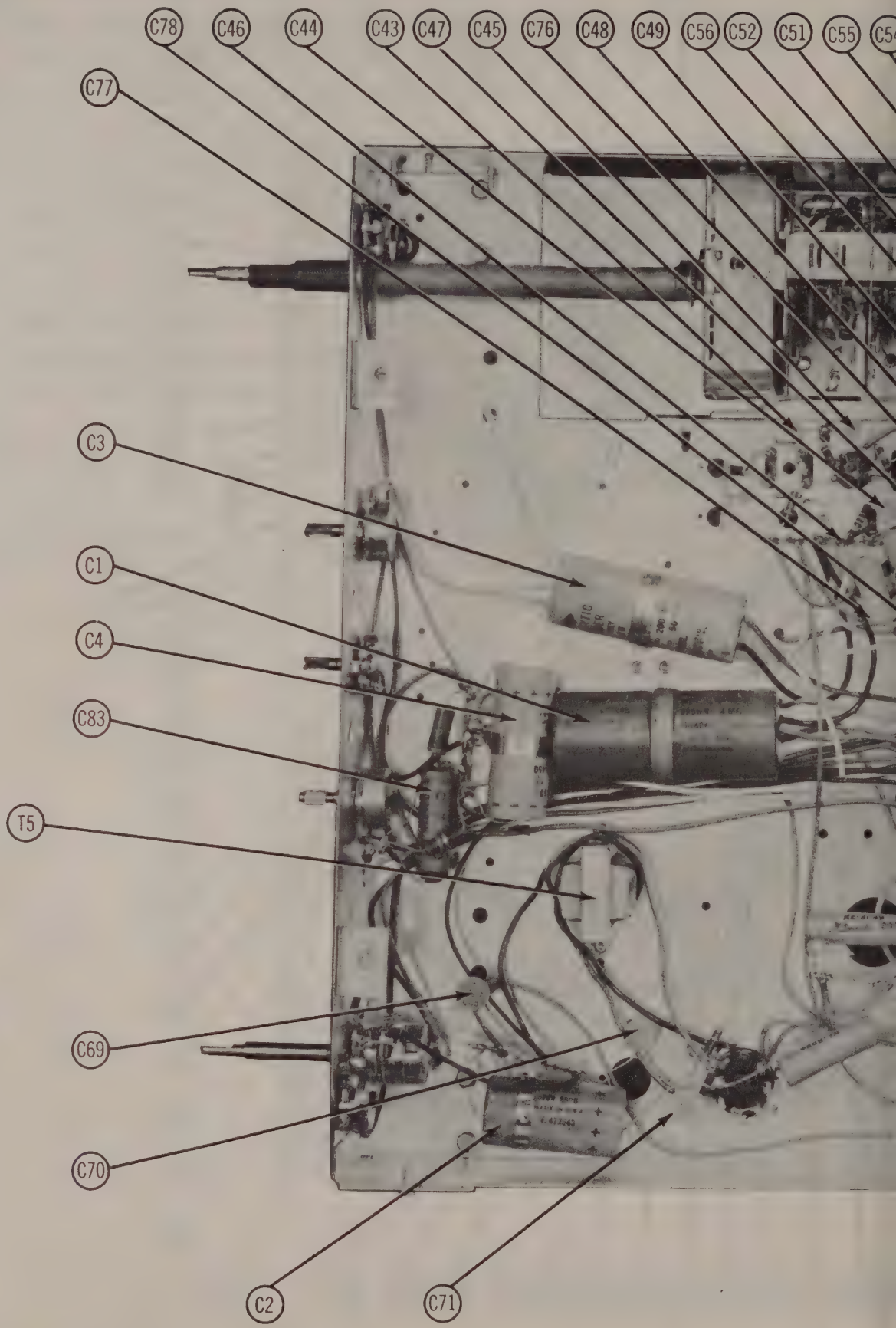


ND INDUCTOR IDENTIFICATION



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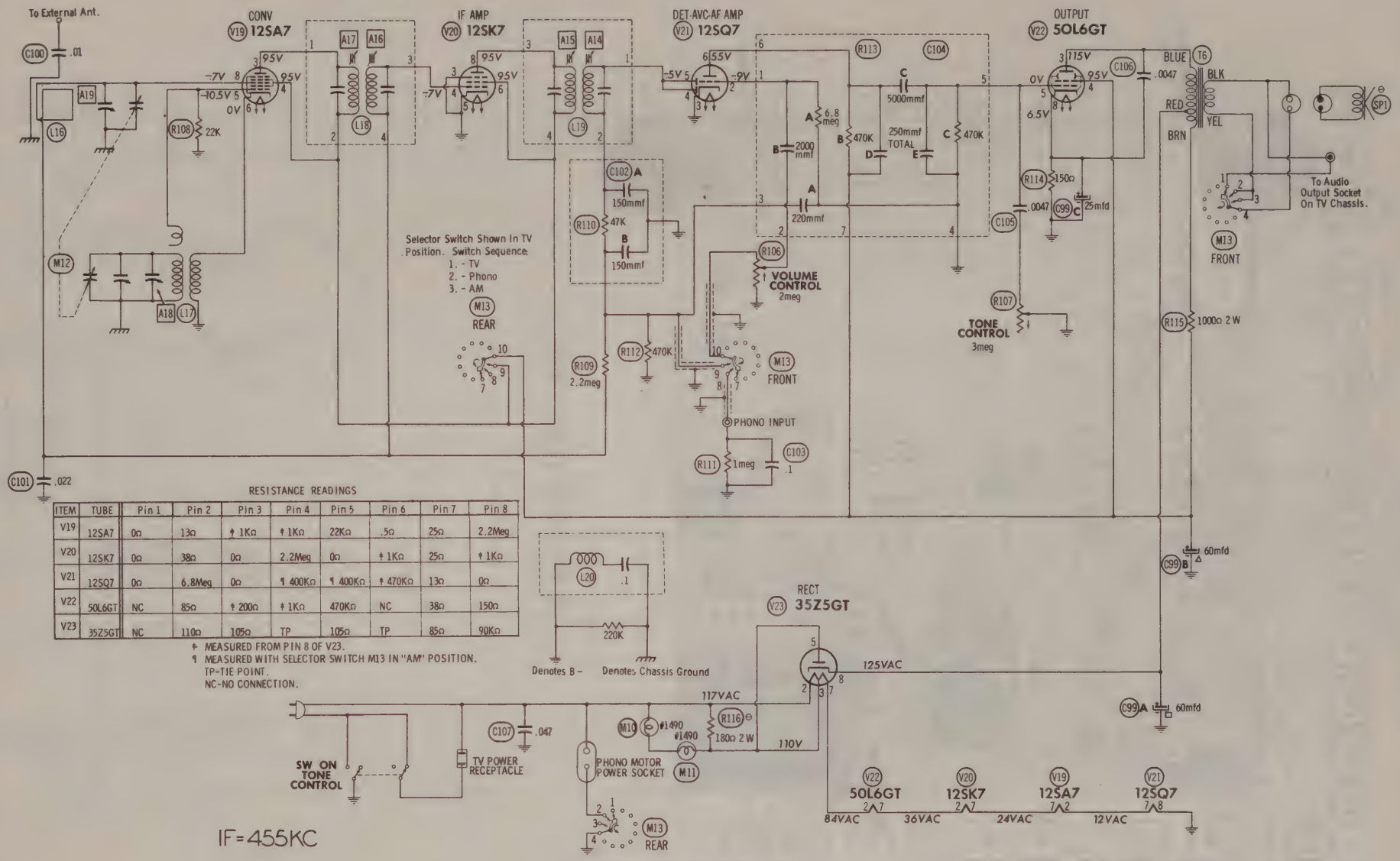
TV CHASSIS BOTTOM VIEW-CAPACITOR



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V19	12SA7	0Ω	13Ω	† 1KΩ	† 1KΩ	22KΩ	.5Ω	25Ω	2.2Meg
V20	12SK7	0Ω	38Ω	0Ω	2.2Meg	0Ω	† 1KΩ	25Ω	† 1KΩ
V21	12SQ7	0Ω	6.8Meg	0Ω	¶ 400KΩ	¶ 400KΩ	† 470KΩ	13Ω	0Ω
V22	50L6GT	NC	85Ω	† 200Ω	† 1KΩ	470KΩ	NC	38Ω	150Ω
V23	35Z5GT	NC	110Ω	105Ω	TP	105Ω	TP	85Ω	90KΩ

† MEASURED FROM PIN 8 OF V23.
¶ MEASURED WITH SELECTOR SWITCH M13 IN "AM" POSITION.
TP=TIE POINT.
NC-NO CONNECTION.

AM Radio Model 110 Used With Combination Models

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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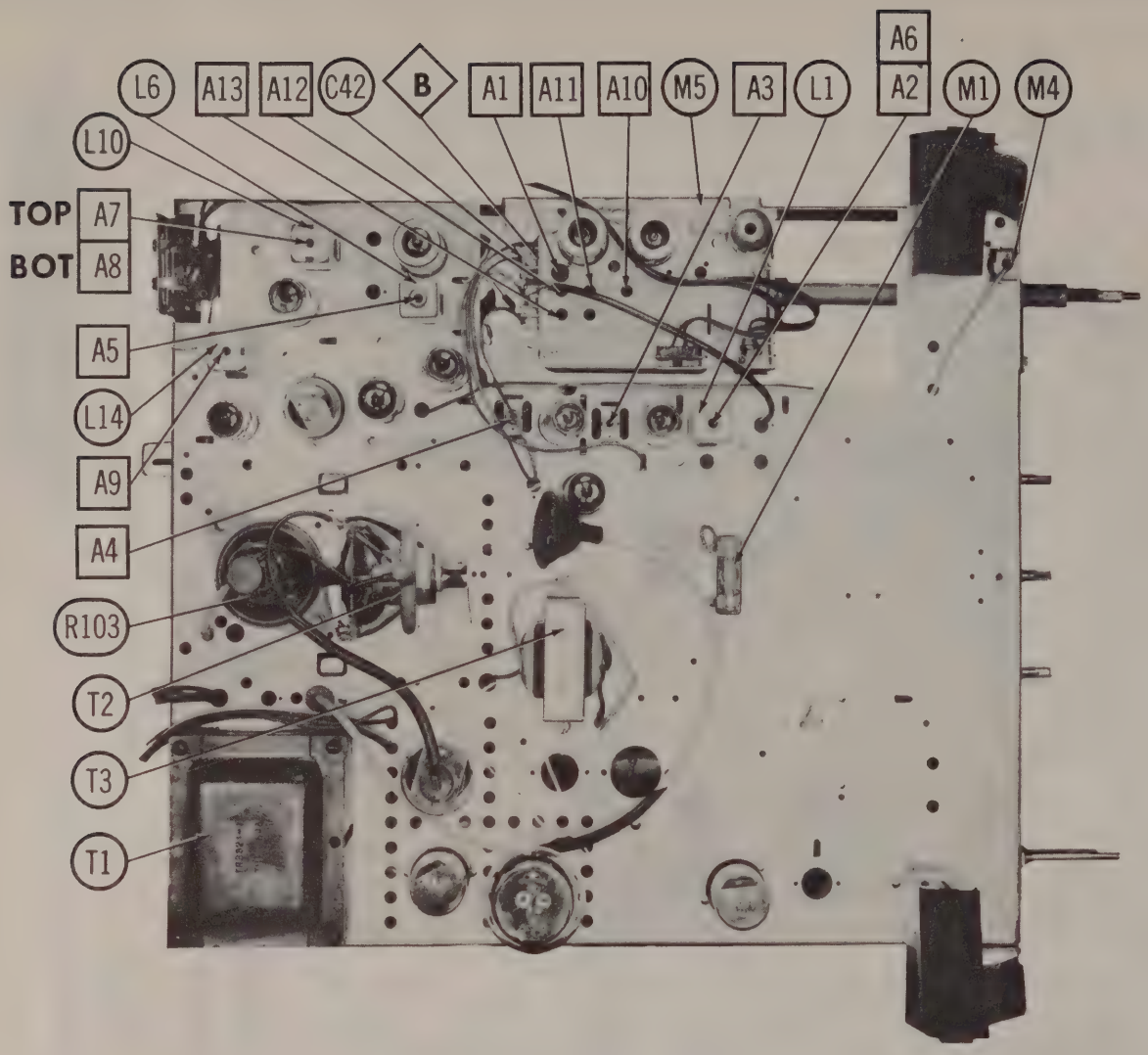
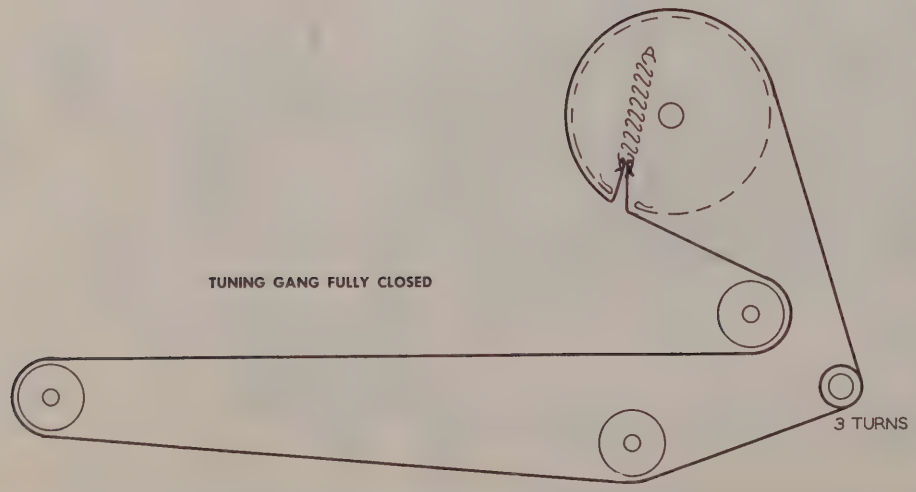
OLYMPIC MODELS C21BG15, 16, C24BH22, 24, K21BG12, 13, 14, K24BH31, 32, 33, T21BG10 (Ch. BG, BH & Radio Model 110)

RADIO SCHEMATIC

OLYMPIC MODELS C21BG15, 16, C24BH22, 24, K21BG12, 13, 14, K24BH31, 32, 33, T21BG10 (Ch. BG, BH & Radio Model 110)



TV CHASSIS TOP VIEW



RADIO DRIVE CORD STRINGING

TV PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4A	
V2	RF Amplifier	6BZ7	
V3	Mixer-Oscillator	6U8	
V4	1st. Video IF Amplifier	6CB6	
V5	2nd. Video IF Amplifier	6CB6	
V6	3rd. Video IF Amplifier	6CB6	
V7	Video Output	12BY7	
V8	Sound IF Amplifier	6AU6	
V9	Audio Detector	6BN6	

ITEM No.	USE	TYPE	NOTES
V10	Audio Output	6W6GT	
V11	Sync Separator-Sync Amplifier	12AU7	
V12	Vert. Mult.-Vert. Output	12BH7	
V13	Horiz. AFC-Horiz. Osc.	6SN7GT	
V14	Horiz. Output	6CU6	Note 1
V15	Damper	6AX4GT	
V16	HV Rectifier	1B3GT	
V17	LV Rectifier	5U4G	

Note 1. 6BQ6GTA/GTB may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	OLYMPIC PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V18	21ALP4A ①	21ALP4A ① 21ALP4 21ALP4B ①	21ALP4A ① 21ALP4 21ALP4A/B ①	21ALP4A ②	① Aluminized ② Silver screen "85"
	24DP4A ①	24DP4A ①	24DP4A ①	24DP4A ② 24DP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	350	CO3380	E59B264	B034	WQ795	TMD-44	D-190	R2065 *
B	60	350			BR435	TC60	TD-4-450	FM-4504	
C	4	350							
C2	50	250	CO2068	PRS250V50	BR5025	TC59	TD-50-250	FM-4550	TVA-1713
C3A	60	200	CO3856	E59B326	B086	WD340	TD-60-250	MTD-4530	R1275
B	125	50					TD-150-50	MTH-5010	
C4	20	450	CO2560	PRS450V20	BR2045	TD75	TD-20-450	FM-4520	TVA-1709

* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	3.3									
C6	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C7	1.1			NP0-S11	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C8	170									
C9	170									
C10	1000			EF-001	MFT-1000				503C-D1	
C11	1000			EF-001	MFT-1000				503C-D1	
C12	150			BPD-00015	DD-151	G046	811-151	UC-5315	5GA-T15	
C13	5-10									
C14	5-10									
C15	15									
C16	15			S115	DD-150	G021	831-150	UC-5415	5GA-Q15	
C17	5.1									
C18	15			S115	DD-150	G021	831-150	UC-5415	5GA-Q15	
C19	2.7									
C20	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C21	6.8			NP0-D16.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C22	1000									
C23	4									
C24	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C25	1000									
C26	.3									
C27	.56									
C28	1.8									
C29	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C30	1000									
C31	15			S115	DD-150	G021	831-150	UC-5415	5GA-Q15	
C32	1.2									
C33	1.5									
C34	10									
C35	1000									
C36	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	1000									
C38	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	2			NP0-S12.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C40	1000									
C41	15									
C42	470		CCD471M	BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C43	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C44	330		CCD331K	BPD-00033	DD-331	G056	811-331	UC-533	5GA-T33	
C45	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C46	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C47	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	470		CCD471K	BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C49	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	330		CCD331K	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C51	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C52	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	4.7		CO1083	NP0-S14.7	TCZ-4R7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	
C55	4.7		CO1083	NP0-S14.7	TCZ-4R7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	
C56	.22	200	CO-H-2224	P288N-22		CUB2P22		PT4022	2TM-P22	
C57	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C58	330		CCD331M	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C59	330		CCD331M	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C60	.1	400	CO-H-4104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C61	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C62	.02	200	CO-H-4203	BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C63	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C64	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

TV PARTS LIST AND DI

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C65	330		CCD331M	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C66	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C67	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C68	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C69	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C70	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C71	10000		CCD103X	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C72	.0022	600	CO-H-6202	B12200	D6-222	CUB6D22	GP2-333-222	PT622	6TM-D22	
C73	330		CCD331M	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C74	.02	400	CO-H-4203	BPD-02	DD-203	CUB4S2	817-02	PT412	4TM-S2	
C75A	2000									
B	5000		♦PC2435	♦PA-110	♦PC-100	♦115TM1	♦1405-01		♦V-1	
C	5000									
C76	.0047	600	CO-O-6472K	1464-0047		1R5D47			MS-247	
C77	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C78	.1	400	CO-H-4104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C79	.01	1000	CO-O-X103	P1088N-01		CUB1S1		PT1611	MB-S1	
C80	47	500	RCM15C470K	1469-000047		5R5Q47			MS-447	
C81	47	500	RCM15C470K	1469-000047		5R5Q47			MS-447	
C82	47	500	RCM15C470K	1469-000047		5R5Q47			MS-447	
C83	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C84	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C85	.02	400	CO-H-4203	BPD-02	DD-203	CUB4S2	817-02	PT412	4TM-S2	
C86	.47	200	CO-H-2474	P288N-47		CUB2P47		PT4047	2TM-P47	
C87	120	500	RCM20C121K	1469-00012		5R5T12	811-121		MS-312	
C88	.01	600	CO-B-6103							
C89	.001	600	CO-O-6102K	1464-001		1R5D1	811-102		MS-21	
C90	680	500	RCM15A681M	S1680	D6-681	1W5T68	GP2K-681	UC-5368	1FM-368	
C91	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C92	.1	400	CO-H-4104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	Note 1
C93	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C94	.22	200	CO-H-2224	P288N-22		CUB2P22		PT4022	2TM-P22	
C95	.47	3000	CO4252							
C96	150	3000	CO3830	HVD-30-150	DD30-151	V3T15	3KV-151		30GA-T15	Note 2
C97	68	2000	CO4012	HVD-30-68	DD30-680	V2Q68	3KV-680		20GA-Q68	
C98	.01	600	CO-B-6103	BPD-01	DD-103	CUB6S1	811-01	PT611	6TM-S1	

Note 1. Chassis BH use .22MFD in this application (part ♦CO-H-4224).
Note 2. Chassis BH use 100MMF in this application (part ♦CO3781).
♦ Items C75A, C75B, C75C, R69A, R69B and R69C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	½	PT3619-1	BX-10	A47-5000-S	Q11-114	.TA53L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	RQ	Not Req.	Attach to R1A.
R2A	1500Ω	½	PT4060	F1-7	RTV-581		UF152R	Contrast (Panel)
B	1Meg	½		R2-52			UR16A	Volume (Rear)
C	Switch			KB-1			US-26	Attach to R2B.
R2A	1500Ω	½	PT3512	F1-7	RTV-515	* QJ-766	UF152R	Contrast-Note 1 (Panel)
B	1Meg	½		R2-52			UR16A †	Volume (Rear)
C	Switch			KB-1			US-26	Attach to R2B.
R3A	50KΩ	½	PT3617	AB-31	A47-50K-S	Q11-123	U-35	Horiz. Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A.
R4A	1Meg	½	PT3616	AB-69	A47-1Meg-S	Q11-137	U-54	Vert. Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R4A.
R5A	1Meg	½	PT3616	AB-69	A47-1Meg-S	Q11-137	U-54	Brightness
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R5A.
R6A	1Meg	½	PT3665-1	BX-69	A47-1Meg-S	Q11-137	TA16L	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	RQ	Not Req.	Attach to R6A.
R7	400Ω	2	PT3611		39-500			Buzz-Wire Wound

Note 1. Used in versions with CL3496 tuner only.
* Concentrikit Equivalent, K-2 Kit, Base Elements & Shafts, B17-109 & P1-106 (Panel)
B13-137 & R1-122 (Rear)
76-1 (Switch)
† Universal Replacement (Mallory Exact Duplicate Part No. UE1895)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	OLYMPIC PART No.	IRC PART No.	NOTES
R8	6800Ω				
R9	1000Ω			BTS-1000	
R10	150Ω				
R11	56Ω			BTS-56	
R12	100KΩ			BTS-100K	
R13	1Meg 5%			BTS-1Meg 5%	
R14	750KΩ 5%			BTS-750K 5%	
R15	470Ω			BTS-470	
R16	6800Ω				
R17	10KΩ				
R18	56KΩ			BTS-56K	
R19	56KΩ			BTS-56K	
R20	15KΩ				
R21	150KΩ				
R22	4700Ω	1		BTA-4700	
R23	56KΩ			BTS-56K	
R24	100Ω			BTS-100	
R25	1Meg		REB105M	BTS-1Meg	
R26	1000Ω		REB102M	BTS-1000	
R27	10KΩ 5%		REB103K	BTS-10K	
R28	15KΩ		REB153K	BTS-15K	
R29	330Ω		REB331M	BTS-330	
R30	47Ω		REB470M	BTS-47	
R31	1000Ω		REB102M	BTS-1000	
R32	1000Ω		REB102M	BTS-1000	
R33	330Ω		REB331M	BTS-330	
R34	47Ω		REB470M	BTS-47	
R35	22KΩ		REB223K	BTS-22K	
R36	330Ω		REB331M	BTS-330	
R37	150Ω		REB151M	BTS-150	
R38	5600Ω		REB562K	BTS-5600	
R39	1.5Meg		REB155K	BTS-1.5Meg	
R40	1Meg		REB105K	BTS-1Meg	
R41	1500Ω		REB152M	BTS-1500	
R42	33KΩ	2	RED333M	BTB-33K	Note 1
R43	10KΩ	2	RED103K	BTB-10K	
R44	8200Ω	2	RED823K	BTB-8200	Note 2
R45	150KΩ		REB154K	BTS-150K	
R46	2700Ω		REB272K	BTS-2700	
R47	22KΩ		REB223K	BTS-22K	
R48	330KΩ		REB334K-A	BTS-330K	
R49	100KΩ		REB104M	BTS-100K	
R50	3900Ω		REB392K	BTS-3900	
R51	1000Ω		REB102M	BTS-1000	
R52	47KΩ		REB473M	BTS-47K	
R53	150Ω		REB151M	BTS-150	
R54	1000Ω		REB102M	BTS-1000	
R55	330KΩ		REB334K-A	BTS-330K	
R56	4700Ω	1	REC472M	BTA-4700	
R57	1Meg		REB105K	BTS-1Meg	Note 3
R58	1Meg		REB105K	BTS-1Meg	
R59	700Ω	10	RE3959	1 3/4A-700	
R60	22KΩ		REB223M	BTS-22K	
R61	470KΩ		REB474M	BTS-470K	
R62	2.2Meg		REB225M	BTS-2.2Meg	
R63	82KΩ		REB823K	BTS-82K	
R64	150KΩ		REB154K	BTS-150K	
R65	82KΩ		REB823K	BTS-82K	
R66	22KΩ		REB223K	BTS-22K	
R67	3900Ω		REB392K	BTS-3900	
R68	82KΩ		REB823K	BTS-82K	
R69A	22KΩ			BTS-22K	
B	8200Ω		♦PC2435	BTS-8200	
C	8200Ω			BTS-8200	
R70	82KΩ		REB823K	BTS-82K	
R71	1Meg		REB105K	BTS-1Meg	
R72	12KΩ		REB123K	BTS-12K	
R73	1.5Meg		REB155K	BTS-1.5Meg	
R74	150KΩ		REB154K-A	BTS-150K	
R75	10Meg		REB106K	BTS-10Meg	
R76	560Ω		REB561K	BTS-560	
R77	2.7Meg		REB275K	BTS-2.7Meg	
R78	1.5Meg		REB155K	BTS-1.5Meg	
R79	1000Ω	2	RED102M	BTB-1000	
R80	560Ω		REB561K		
R81	560Ω		REB561K		
R82	330KΩ		REB334K-A		
R83	820KΩ	1	REC824K-A		
R84	330KΩ 5%	1	REC334J-A		
R85	82KΩ 5%	1	REC823J-A		

RESIST

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA OLYMPIC PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R86	3900Ω		REB392K		
R87	82KΩ		REB823K		
R88	68KΩ	1	REC683K-A		Note 4
R89	150KΩ		REB154K-A		Note 5
R90	150KΩ 5%	1	REC154J-A		
R91	8200Ω		REB822K		
R92	180KΩ		REB184K-A		
R93	100KΩ		REB104K-A		Note 6
R94	150KΩ	1	REC154K-A		Note 7
R95	22KΩ		REB223M		

Note 1. In chassis BH, a 47KΩ 2W resistor is
Note 2. In chassis BH, a 10KΩ 2W resistor is
Note 3. In chassis BH, an 820KΩ resistor is
Note 4. In chassis BH, a 47KΩ 1W resistor is
Note 5. In chassis BH, a 330KΩ resistor is u
Note 6. In chassis BH, a 150KΩ resistor is u
Note 7. In chassis BH, a 100KΩ 1W resistor i
Note 8. In chassis BH, a 12KΩ 2W resistor is
Note 9. Not used in chassis BH.
♦ Items R69A, R69B, R69C, C75A, C75B, C75

TRANSFORMI

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	OLYMPIC PART No.
T1	117VAC	580VCT	5V	6.3V	TR3821-1
	② 1.42A	③ .200A	② 3A	② 8A	

① Tape 6.3V ② 1.2A winding.

TRANSFORMERS (

ITEM No.	USE	OLYMPIC PART No.	Halldorson PART No.	Merit PART N
T2	Horiz. Output Trans.	TR3599-2	FB411 * ①	HVO-9 ②
T3	Vert. Output Trans.	TR3689	Z1900 ②	A-3039
T4A	Yoke(90°)Horiz.(18.5MH)	CL3600	DF607 ④	MDF-9
B	Vert. (41MH)			

① Drill new mounting hole(s).
② Use 18 to 1 turns ratio.
③ Connect blue lead to plate connect red lead of transformer
connect it and green lead of transformer to junction C4, R
④ Connect horizontal damping network across terminals #3 a

*HORIZONTAL OUTPUT TRA

Use Original Width Coil Un

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replace Connec
	9	9	9	9
	8	8	8	8
	6	8	8	7
	2 & 3	3	3	3
	1	1	1	1

TRANSFORMER (A

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.
T5	2.4KΩ	3-4Ω	TR2766-1	Z1101	A3025

SPEA

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	OLYMPIC PART No.	QUAM PART No.
SP1	8"	PM	3-4Ω	SK1906-2 ①	8A21
	5"	PM		SK1788-2 ②	5A07
	5"	PM		SK3147-1 ③	
	8"	PM		SK3148-1 ④	
	8"	PM		SK3891 ⑤	8A21

COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	OLYMPIC PART No.
L1	1st. Video IF	0Ω	.1Ω	CL3833-1
L2	Fil. Choke	0Ω		CL2427
L3	2nd. Video IF	.1Ω	.1Ω	CL3831
L4	Fil. Choke	0Ω		CL2427
L5	3rd. Video IF	.1Ω	.1Ω	CL3831
L6	4th. Video IF	.2Ω	.2Ω	CL3500
L7	Series Peaking Coil	.1Ω		CK4225
L8	Series Peaking Coil	5Ω		CL3401
L9	Shunt Peaking Coil	12Ω		CL3403
L10A	4.5MC Trap	2Ω		TR3386
B	Sound IF	2Ω		
L11	Series Peaking Coil	8Ω		CL3398

PROPERTY OF
L. F. RUANTENSHIP
3974 MAPLE ST
DENVER, COLORADO

CAPACITORS (cont)

ITEM No.	RATING CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C85	330		CCD331M	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C86	5000		CCD502X	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C87	5000		CCD502X	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C88	1000		CCD102X	BPD-001	DD-102	K069	811-001	DC-521	5HK-D1	
C89	1000		CCD102X	BPD-001	DD-502	K060	811-005	DC-525	5HK-D5	
C70	5000		CCD502X	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C71	10000		CCD103X	BPD-01	DD-103	K083	811-01	DC-511	5HK-E1	
C72	.0033	600	CO-H-6303	HD2300	DD-333	CUBSD33	GP3-333-103	PT361	5TM-D33	
C73	330		CCD331M	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C74	.02	400	CO-H-6303	BPD-03	DD-303	CUBSD3	811-03	PT413	4TM-S3	
C75A	2000									
B	5000		●PC2435	●PA-110	●PC-100	●115TM1	●1406-01		●V-1	
C	5000									
C76	.0047	600	CO-O-6472K	1464-0047		IR5D47			MS-247	
C77	.047	400	CO-H-6473	BPD-05	DF-503	CUBH647		PT4147	4TM-S47	
C78	.1	400	CO-H-6104	1468-01	DF-104	CUBH1		PT4101	4TM-P1	
C79	.01	1000	CO-O-3103	P1068N-01		CUBH3S1		PT361	MB-S1	
C80	47	500	RCM47C479K	1469-000047		SR5Q47			MS-447	
C81	47	500	RCM15C470K	1469-000047		SR5Q47			MS-447	
C82	47	500	RCM15C470K	1469-000047		SR5Q47			MS-447	
C83	.047	400	CO-H-6473	BPD-05	DF-503	CUBH647		PT4147	4TM-S47	
C84	.047	400	CO-H-6473	BPD-05	DF-503	CUBH647		PT4147	4TM-S47	
C85	.03	400	CO-H-6303	BPD-03	DD-303	CUBH3	811-03	PT413	4TM-S3	
C86	.47	200	CO-O-3474			CUBP347		PT4047	2TM-S47	
C87	120	500	RCM20C121K	1469-00021		SR5T12	■1-121		MS-315	
C88	.01	600	CO-H-6103			IR5D1	811-103		MS-31	
C89	.001	600	CO-O-6102K	1464-001		IR5D1	811-102		MS-21	
C90	560	500	RCM3GA681M	E1680	DE-681	IWF568	GP2K-681	UC-5368	1PM-368	
C91	.047	400	CO-H-6473	BPD-05	DF-503	CUBH647		PT4147	4TM-S47	
C92	.1	400	CO-H-6104	P468-1	DF-104	CUBH91		PT401	4TM-P1	Note 1
C93	1000		CO-O-3102	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C94	.22	200	CO-H-2334	P388N-22		CUBH223		PT4022	2TM-P22	
C95	.47	3000	CO4252							
C96	150	3000	CO3S30	HVD-30-150	DD30-151	V3T15	3KV-151		30GA-T15	Note 2
C97	68	2000	CO4012	HVD-30-68	DD30-680	V2Q68	3KV-680		30GA-Q68	
C98	.01	600	CO-H-6103	BPD-01	DD-103	CUBH61	811-01	PT611	6TM-S1	

Note 1. Chassis BH use .22MFD in this application (part #CO-H-4224).
Note 2. Chassis BH use 100MMF in this application (part #CO3781).
● Items C76A, C76B, C76C, R68A, R69B and R69C are combined in one unit.

CONTROLS

ITEM No	RATING RESIST-ANCE	WATTS	OLYMPIC PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω		PT3619-1	BX-10	A47-5000-S	QU-114	TA5SL	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	RQ	Not Req.	Attach to R1A.
R2A	150Ω		PT4080	F1-7	RTV-581		UF152R	Contrast (Panel)
B	1Meg	‡		B2-52			UR18A	Volume (Rear)
C	Switch			KB-1			UB-26	Attach to R2B.
R3A	1500Ω		PT3512	F1-7	RTV-518	* QU-766	UF152R	Contrast-Note 1 (Panel)
B	1Meg	‡		B2-52			UR18A	Volume (Rear) †
C	Switch			KB-1			UB-26	Attach to R2B.
R3A	60KΩ		PT3617	AB-21	A47-50K-S	QU-123	U-35	Horiz. Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A.
R4A	1Meg	‡	PT3618	AB-69	A47-1Meg-S	QU-137	U-54	Vert. Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R4A.
R5A	1Meg	‡	PT3616	AB-89	A47-1Meg-S	QU-137	U-54	Brightness
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R5A.
R6A	1Meg	‡	PT3565-1	B2-69	A47-1Meg-S	QU-137	TA16L	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	RQ	Not Req.	Attach to R6A.
R7	400Ω	2	PT3611		39-500			Buzz-Wire Wound

Note 1. Used in versions with CL3496 tuner only.
* Concentrikit Equivalent, R-3 Kit, Base Elements & Shafts, B17-109 & P1-106 (Panel)
B13-137 & R1-122 (Rear)
T6-1 (Switch)
† Universal Replacement (Mallory Exact Duplicate Part No. UE1895)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	OLYMPIC PART No.	IRC PART No.	NOTES
R48	680Ω			BTS-330K	
R49	100Ω			BTS-100K	
R50	100Ω			BTS-100K	
R51	8Ω			BTS-56	
R52	100KΩ			BTS-100K	
R53	1Meg 5%			BTS-1Meg 5%	
R54	750KΩ 5%			BTS-750K 5%	
R55	470Ω			BTS-470	
R56	68000Ω				
R57	10KΩ				
R58	56KΩ			BTS-56K	
R59	56KΩ			BTS-56K	
R60	15KΩ				
R61	180KΩ				
R62	4700Ω	1		BTA-4700	
R63	56KΩ			BTS-56K	
R64	100Ω			BTS-100	
R65	1Meg		RBS106M	BTS-1Meg	
R66	1000Ω		RBS103M	BTS-1000	
R67	10KΩ 5%		RBS103K	BTS-10K	
R68	15KΩ		RBS153K	BTS-15K	
R69	330Ω		RBS331M	BTS-330	
R70	47Ω		RBA470M	BTS-47	
R71	1000Ω		RBS102M	BTS-1000	
R72	1000Ω		RBS102M	BTS-1000	
R73	330Ω		RBS331M	BTS-330	
R74	47Ω		RBA470M	BTS-47	
R75	1000Ω		RBS102M	BTS-1000	
R76	22KΩ		RBS223K	BTS-22K	
R77	330Ω		RBS331M	BTS-330	
R78	150Ω		RBS15M	BTS-150	
R79	5600Ω		RBS562K	BTS-5600	
R80	1.5Meg		RBS155K	BTS-1.5Meg	
R81	10KΩ		RBS103K	BTS-10K	
R82	3300Ω	2	RBD332K	BTS-3300	Note 1
R83	10KΩ	2	RBD103K	BTS-10K	
R84	8200Ω	2	RBD822K	BTS-8200	Note 2
R85	150KΩ		RBS154K	BTS-150K	
R86	5600Ω		RBS562K	BTS-5600	
R87	10KΩ	2	RBD103K	BTS-10K	
R88	330KΩ		RBD334K	BTS-330K	
R89	100KΩ		RBS104M	BTS-100K	
R90	100KΩ		RBS104M	BTS-100K	
R91	1000Ω		RBS102M	BTS-1000	
R92	47KΩ		RBS473M	BTS-47K	
R93	150KΩ		RBS154K	BTS-150K	
R94	10000Ω		RBS103M	BTS-10K	
R95	22KΩ		RBS223K	BTS-22K	
R96	1000Ω		RBS102M	BTS-1000	
R97	470KΩ		RBS474M	BTS-470K	
R98	8200Ω	2	RBD822K	BTS-8200	Note 2
R99	47KΩ		RBS473M	BTS-47K	
R100	100KΩ 5%		RBS104K-A	BTS-100K	
R101	33Ω			BTS-33	
R102	100Ω			BTS-100	
R103	5.3Ω	1	RE53XM1	BW1-5.3	
R104	300Ω	20	RB3S49	2D-300	Note 3
R105	100KΩ	1	REC104M	BTA-100K	
R106	47Ω		RBA470M		
R107	4700Ω		RBA472M		
R108	1.5Meg		RBS155K	BTS-1.5Meg	
R109	2.7Meg		RBS275K	BTS-2.7Meg	
R110	5600Ω		RBS562K	BTS-5600	
R111	2.7Meg		RBS275K	BTS-2.7Meg	
R112	1.5Meg		RBS155K	BTS-1.5Meg	
R113	10000Ω	2	RBD103M	BTS-10K	
R114	560Ω		RBS561K		
R115	330Ω		RBS331M		
R116	330KΩ		REC334K-A	BTS-330K	
R117	820KΩ		RBS824K-A	BTS-820K	
R118	2200Ω		RBS222K	BTS-2200	
R119	33KΩ		RBS333K	BTS-33K	
R120	82KΩ		RBS823K	BTS-82K	
R121	1Meg		RBS106M	BTS-1Meg	
R122	150KΩ		RBS154K	BTS-150K	
R123	33KΩ		RBS333K	BTS-33K	
R124	22KΩ		RBS223K	BTS-22K	
R125	1Meg		RBS106M	BTS-1Meg	
R126	1000Ω		RBS102M	BTS-1000	
R127	5900Ω		RBS592K	BTS-5900	
R128	15KΩ		RBS153K	BTS-15K	
R129	82KΩ		RBS823K	BTS-82K	
R130	22KΩ		RBS223K	BTS-22K	
R131	3900Ω		RBS392K	BTS-3900	
R132	15KΩ		RBS153K	BTS-15K	
R133	82KΩ		RBS823K	BTS-82K	
R134	1MEG		RBS105K	BTS-1MEG	
R135	12KΩ		RBS123K	BTS-12K	
R136	1.5MEG		RBS155K	BTS-1.5Meg	
R137	1MEG		RBS105K	BTS-1MEG	
R138	10MEG		RBS106K	BTS-10Meg	
R139	560Ω		RBS561K	BTS-560	
R140	2.7MEG		RBS275K	BTS-2.7Meg	
R141	1.5MEG		RBS155K	BTS-1.5Meg	
R142	100KΩ	2	RBD104M	BTS-100K	
R143	560Ω		RBS561K		
R144	330KΩ		REC334K-A		
R145	820KΩ	1	REC824K-A		
R146	330KΩ 5%	1	REC334J-A		
R147	82KΩ 5%	1	RC42GJ-A		

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	OLYMPIC PART No.	IRC PART No.	NOTES
R86	390Ω		REB392K		
R87	82KΩ		REB823K		
R88	68KΩ		REC683K-A		Note 4
R89	150KΩ		REB154K-A		Note 5
R90	150KΩ 5%	1	REC154J-A		
R91	820Ω		REB822K		
R92	180KΩ		REB184K-A		
R93	100KΩ		REB104K-A		Note 6
R94	150KΩ	1	REC154K-A		Note 7
R95	33KΩ		REB333M		

ITEM No.	RATING OHMS	WATT	OLYMPIC PART No.	IRC PART No.	NOTES
R96	47Ω		REB470M		
R97	470KΩ		REB474M		
R98	8200Ω	2	RED822K		Note 8
R99	47KΩ		REB473M	BTS-47K	
R100	100KΩ 5%		REC104K-A	BTS-100K	
R101	33Ω		REC330M		
R102	100Ω		REB101K		
R103	5.3Ω	1	RE53XM1	BW1-5.3	
R104	300Ω	20	RB3S49	2D-300	Note 9
R105	100KΩ	1	REC104M	BTA-100K	

Note 1. In chassis BH, a 47KΩ 2W resistor is used in this application (Part No. RED473M).
Note 2. In chassis BH, a 10KΩ 2W resistor is used in this application (Part No. RED103K).
Note 3. In chassis BH, an 820KΩ resistor is used in this application (Part No. REB824K).
Note 4. In chassis BH, a 47KΩ 1W resistor is used in this application (Part No. REC473K-A).
Note 5. In chassis BH, a 330KΩ resistor is used in this application (Part No. REB334K-A).
Note 6. In chassis BH, a 150KΩ resistor is used in this application (Part No. REB154K-A).
Note 7. In chassis BH, a 100KΩ 1W resistor is used in this application (Part No. REC104K).
Note 8. In chassis BH, a 12KΩ 2W resistor is used in this application (Part No. RED123K).
Note 9. Not used in chassis BH.
● Items R89A, R89B, R89C, C75A, C75B, C75C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	560VCT	6V	6.3V	TR3581-1	P9733 ①	P5235 ①	P8164 ①		
	② 1.43A	③ .300A	④ 3A	⑤ 6A						

① Tape 6.3V @ 1.3A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	OLYMPIC PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Horiz. Output Trans.	TR3589-2	P3411 * ①	HVO-8 * ①	2357T * ①	XO80 * ①	A-8383 * ①	FLY-14 * ①	D-18 * ①
T3	Vert. Output Trans.	TR3586	21900 ②	A-3030 ① ②	2367T ① ②	V31 ① ②	A-8541 ① ②	26584 ① ②	A-10431 ① ②
T4A	Yoke(90°Horiz.(8.5MHz	CL3600	DF607 ③	MDF-23	235D1 ④	Y90F18/43 ③ ④	DY-16A	Y-18 ③	Y-41-1
B	Vert. (41MH)								

① Drill new mounting hole(s).
② Use 18 to 1 horiz ratio.
③ Connect blue lead to plate connect red lead of transformer to black lead of yoke. Remove green lead of yoke from ground and connect it and green lead of transformer to junction C4, R6, R79, and R94.
④ Connect horizontal damping network across terminals #3 and #7. Use original if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

5"	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9	9	9	9	9	9
	8	8	8	8	8	8	8	8
	6	6	6	7	7	7	7	7
	2 & 5	3	3	3	2	3	3	3
	1	1	1	1	1	1	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	SEC	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	2.4KΩ	3-4Ω	TR2766-1	Z1161	A3025	A3333	26588 ①	S-12X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	RCA TYPE No	NOTES
SP1	5"	PM	3-4Ω	SK1906-2 ①	8A2I	2346I	① Used in Models K21BG12, K24BH31.
	5"	PM		SK1798-3 ②	5A0T	2056B	② Used in Model T21BG10.
	5"	PM		SK3147-1 ③			③ Tweeter, used in Model K21BG13, K21BG14, K24BH31, K24BH32, K24BH33.
	8"	PM		SK3146-1 ④			④ "Woofer" used in Models K21BG13, K21BG14, K24BH32, K24BH33.
	8"*	PM		SK3091 ⑤	8A2I	2346I	⑤ Used in Models C21BG15, C21BG16, C24BH22, C24BH30.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1	1st. Video IF	0Ω	.1Ω	CL3833-1				Includes 41.25MC trap
L2	1st. Chake	0Ω		CL3427	19-1001		4604	1.4 Microhenries
L3	2nd. Video IF	.1Ω	.1Ω	CL3831	17-4533	TV-130	6319	
L4	1st. Chake	0Ω		CL3427	19-1001		4604	1.4 Microhenries
L5	3rd. Video IF	.1Ω	.1Ω	CL3831	17-4533	TV-130	6319	
L6	4th. Video IF	.2Ω	.2Ω	CL3500	17-5004	TV-125	6234	
L7	Series Peaking Coil	.1Ω		CK4225	19-1001		4604	1.7 Microhenries
L8	Series Peaking Coil	8Ω		CL3401	19-3078 *	TV-181 *	6172 *	80 Microhenries, wound on 22KΩ resistor
L9	68mmi Peaking Coil	12Ω		CL3403	19-3300 ■	TV-190 ■	6186 ■	300 Microhenries, wound on 1MEg resistor
L10A	4.5MC Trap	2Ω		TR3386				
B	Sound IF	2Ω						
L11	Series Peaking Coil	8Ω		CL3398	19-3290 ●	TV-185 ●	6181 ●	250 Microhenries, wound on 15KΩ resistor

COILS (cont)

ITEM No.	USE	DC RES. PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L12	Shunt Peaking Coil	12Ω		CL3403				300 Microhenries, wound on 1MEg resistor
L13	RF Choke	5Ω		CL3401	19-3075 *	TV-181 *	6172 *	80 Microhenries, wound on 22KΩ resistor
L14	Quadrature Coil	3.5Ω		CL3603-1			1481	

† Parallel with 22KΩ resistor.
● Parallel with 1MEg resistor.
■ Parallel with 15KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	SEC.	OLYMPIC PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordarson PART No	NOTES
L15	22Ω	58Ω	TR2294	20-1402 *	TV-162 *	6183 *	205R1 *	H-100 *	HI-3 *	Waveform winding -55Ω

* Reverse coil mounting in can.

FUSES

ITEM No.	TYPE	RATING	OLYMPIC PART No		LITTELFUSE PART No		BUSS PART No	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2/5A 250V	FU3952	FH3852	312. 375 (3AG 3/8A)	357001	AGC 3/8	4405

CRYSTAL DIODES

ITEM No.	ORIG TYPE	REPLACEMENT DATA OLYMPIC PART No	SYLVANIA PART No.	NOTES
M2	D550		1N82 or 1N82A	UHF Mixer (Clip in)
M3	1N54 *		1N54 or 1N60	Video Det. (Pigtail)

* Some versions may use crystal diode type 1N60 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M4	Dial Light		#47
M5	Tuner	CL4044	VHF-UHF Combination, Not used in some versions VHF-UHF Combination Tuner Part No. CL3496 may be used in some versions.
M6	Centering Device	PT3783	
M7	Ion Trap	PT3248	
M8	Trimmer Cap.	CT2S26	Horiz. Drive (10-580MMF)
	Indicator Dial	DL3547	Used with tuner Part No. CL3496
	Indicator Dial	DL4029	Used with tuner Part No. CL4044

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V19	Converter	12SA7	
V20	IF Amplifier	12SK7	
V21	Det.-AVC-AF Amplifier	12SQ7	
V22	Output	50L6GT	
V23	Rectifier	35Z5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	FYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C99A	●60	150	CO4093	AFH3-81	●CG12	●FP216.6	●TMD-15	●D-080	R3358 *	
B	●80	150			BR252	TC26	TD-25-25	▲FM-0225		
C	●25	25								

* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C100	.01	600	CO-H-6103	BPD-01	DD-103	CUBSD1	GP3-333-103	PT611	6TM-S1	
C101	.022	600	CO-H-6203	BPD-02	DD-203	CUBSD22	811-02	PT622	6TM-S22	
C102A	150		†PC2478	†PA-98	†PC-51	†111TM3	†1403-02	UC-5315	†D-2	
B	150							UC-5315		
C103	.1	400	CO-H-4104	P468M-1	DF-104	CUB4P1		PT401	4TM-P1	
C104A	3300									
B	3000									
C	5000		†PC-2477	† PA-113-1	†PC-150	†115TM1	†1406-01		† DT-1	
D	250									
E										
C105	.0047	600	CO-H-6472	1464-0047		CUBSD47	GP3-333-472	PT2347	6TM-D47	
C106	.0047	600	CO-H-6472	1464-0047		CUBSD47	GP3-333-472	PT2347	6TM-D47	
C107	.047	400	CO-H-6503	BPD-05	DF-503	CUBH647		PT4147	4TM-S47	

† Items C102A, C103B, and R110 are combined in one unit.
● Items C99A, C104C, C104D, C104E, R113A, R113B and R113C are combined in one unit.
When replacing items separately, C104D and C104E should total 250MMF.

CONTROLS

ITEM No	RATING RESIST-ANCE	WATTS	OLYMPIC PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R108A	1Meg		PT-567	ABT-50	A47F5-1Meg	Q13-152X	UT-649	Volume
B	Shaft	‡	Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R108A.
R107A	5Meg		PT-3180	AB-85	A47-1Meg-S		U-57	Tone
B	Shaft		Not Req.	AK-4	KSS-3		Not Req.	Attach to R107A.
C	Switch		Not Req.	KB-3	SWK-2		UB-28	Attach to R107A.

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R108	22KΩ		REB223M	BTS-22K	
R109	2.2Meg		REB225M	BTS-2.2Meg	
R110	47KΩ		† PC2478	BTS-47K	
R111	1Meg		REB105M	BTS-1Meg	
R112	470KΩ		REB474M	BTS-470K	
R113A	6.8Meg		‡ PC2477	BTS-6.8Meg	
B	470KΩ			BTS-470K	
C	470KΩ			BTS-470K	
R114	150Ω		REB151K	BTS-150	
R115	1000Ω	2	RED102M	BTB-1000	
R116	180Ω	2		BTB-180	Note 10
R117	220KΩ		REB224M	BTS-220K	

Note 10. Some versions use a 330Ω 1W resistor in this application (Part No. REC331M).

† Items R110, C102A, C102B are combined in one unit.

‡ Items R113A, R113B, R113C, C104A, C104B, C104C, C104D, C104E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	2.4KΩ	3-4Ω	TR2690-1	Z1103 ①	A-3031 ①	A-3330 ①	24S50A ①	S-16X ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L16	Loop Ant.	.2Ω	3Ω	LP2687				
L17	Osc. Coil	.5Ω	6Ω	CL2709	14-1073		69-OSC ♦	
L18	Input IF	16Ω	16Ω	TR1644	16-6758	BC-352	12-C1	
L19	Output IF	16Ω	16Ω	TR1644	16-6758	BC-353	12-C2	
L20	Chassis Isolation	0Ω						12 turns #20 wire wound on .1MMF cap.

♦ Drill mounting hole.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	OLYMPIC PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M8				46T	0-1 or S-1 and 0-3	

ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

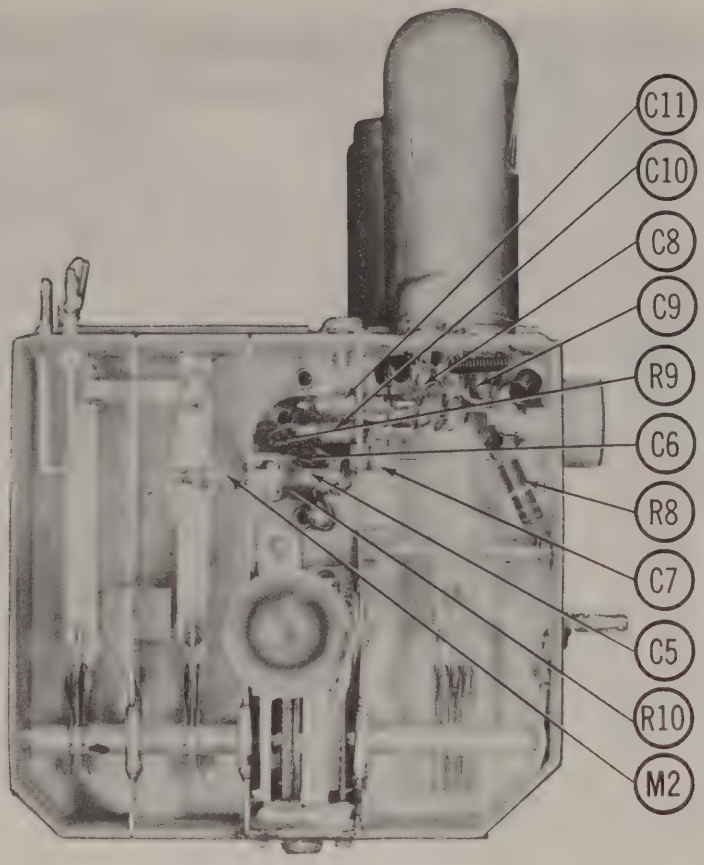
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

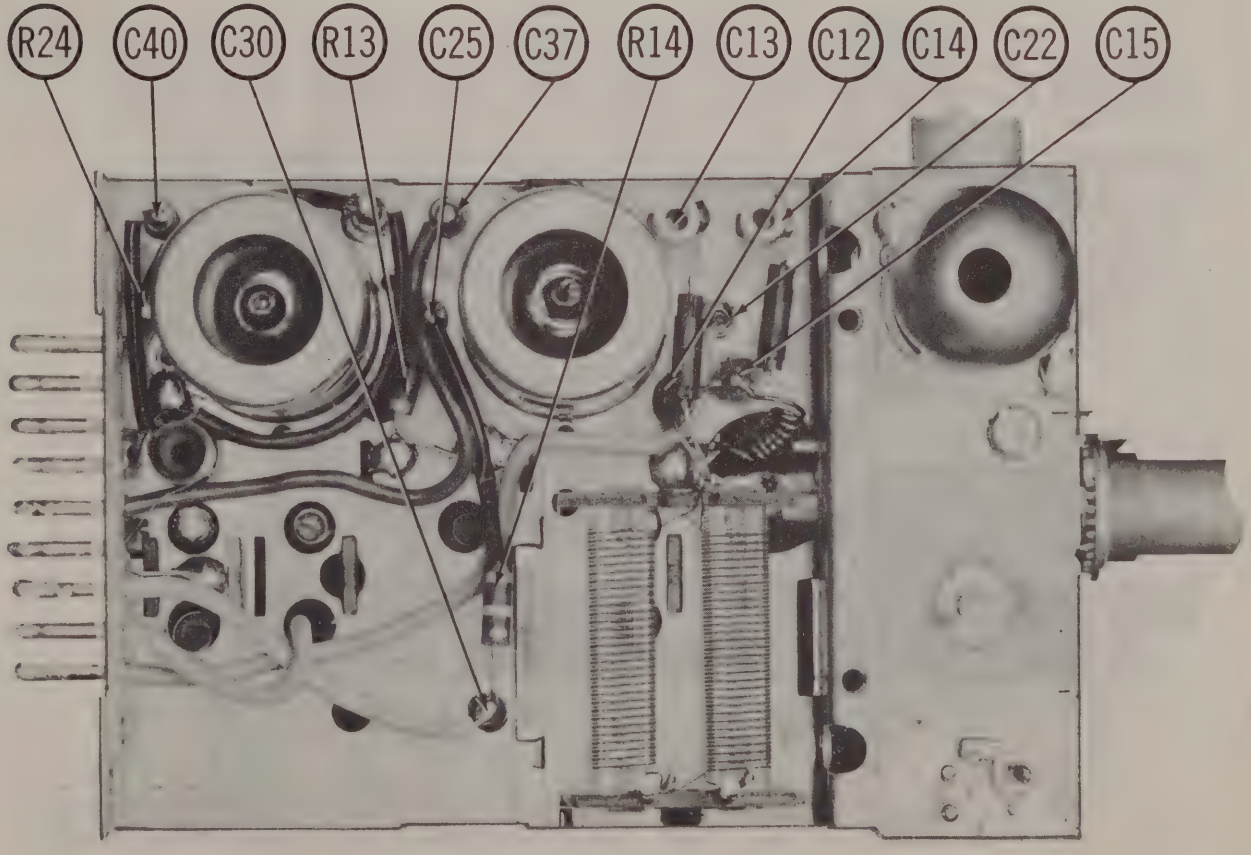
ITEM No.	REPLACEMENT DATA				REMARKS
	OLYMPIC PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M9	78RPM Needle	† CR-55 or ♦ CR-55D	† C-449 or ♦ C-449D	† W-64S or ♦ W-64D	† Jewel ♦ Diamond
	33 1/3-45RPM Needle	† CR-55LP or ♦ CR-55LPD	† A-448 or ♦ A-448D	† W-64MGS or ♦ W-64MGD	

MISCELLANEOUS

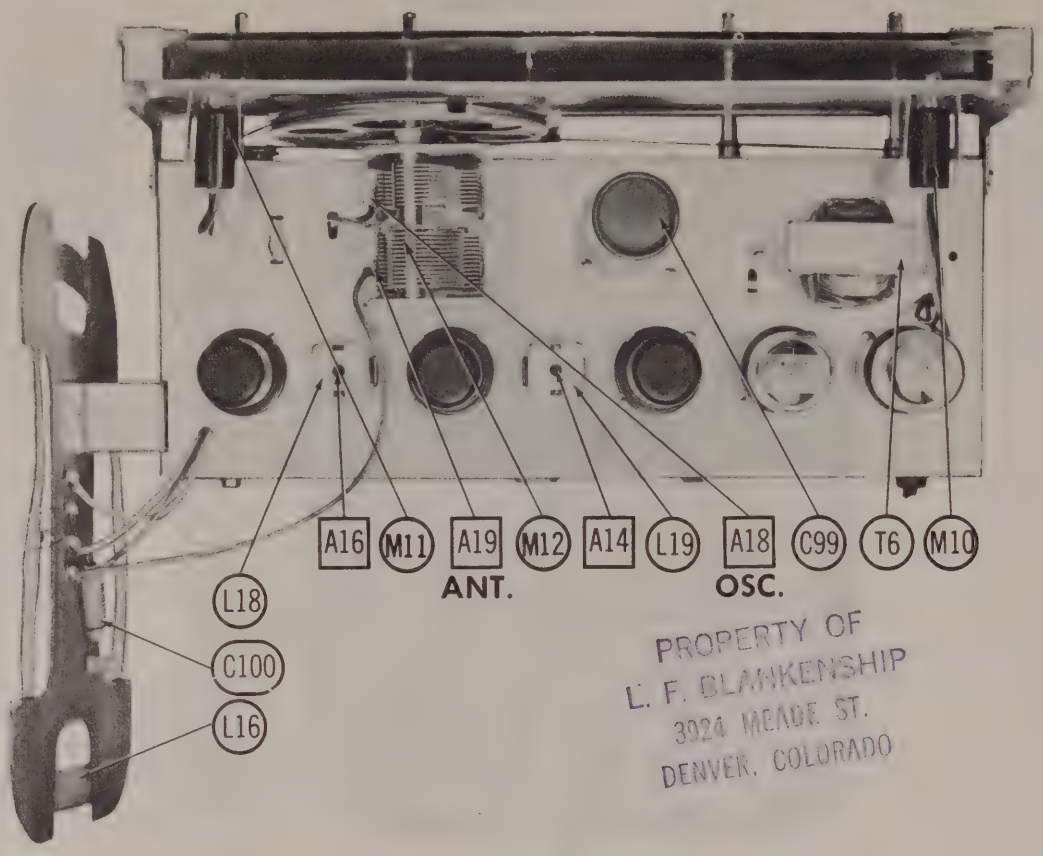
ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M10	Dial Light		#1490
M11	Dial Light		#1490
M12	Tuning Cap.	CV-2681	2 Gang (24-447MMF, 30-195MMF)
M13	Switch	SW-2689	AM-Phono-TV (4 Pole-3 Position, Rotary, Wafer Type)
	Knob	KN3869	Volume (Mahogany)
	Knob	KN3869-1	Volume (Tan)
	Knob	KN3875	On-Off-Tone (Mahogany)
	Knob	KN3875-1	On-Off-Tone (Tan)
	Knob	KN3870	Tuning (Mahogany)
	Knob	KN3870-1	Tuning (Tan)
	Knob	KN3874	AM-Phono-TV (Mahogany)
	Knob	KN3874-1	AM-Phono-TV (Tan)
	Dial Scale	DL2943-2	
	Dial Pointer	PO1011	



UHF TUNER FRONT VIEW

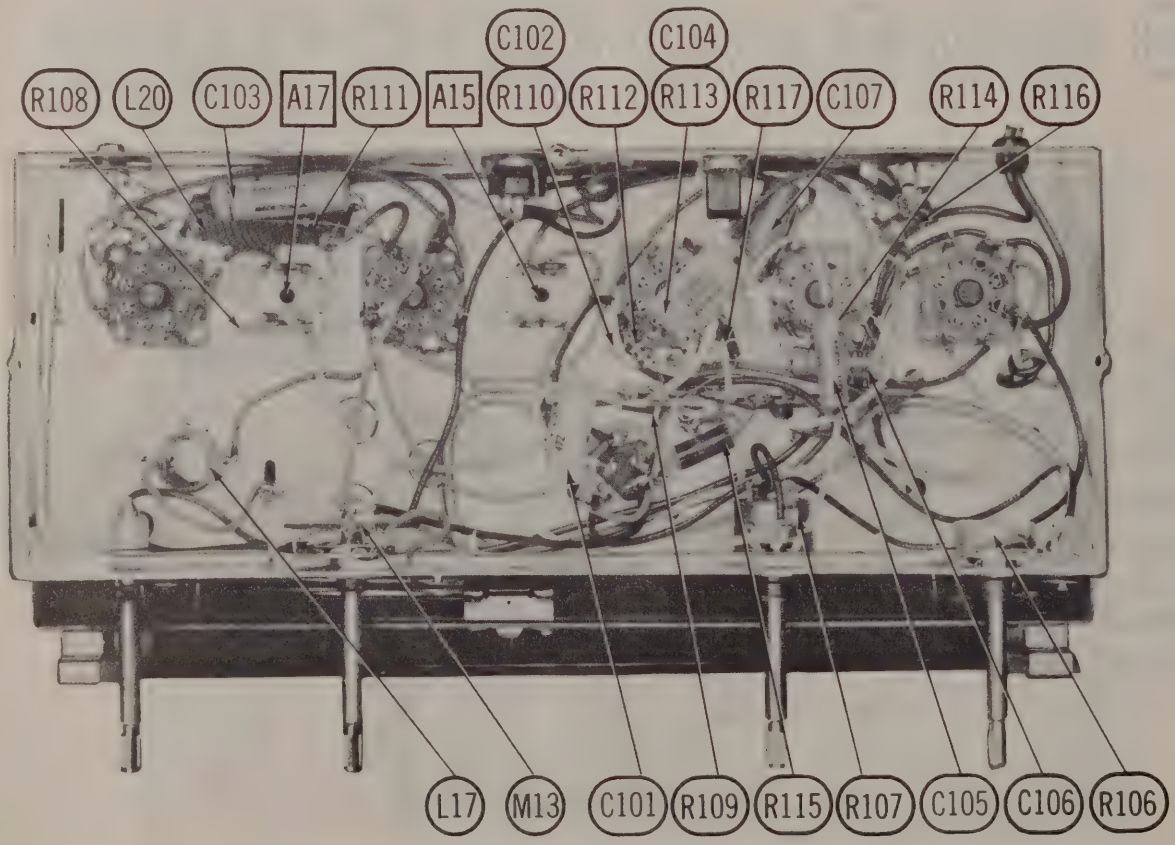


RF TUNER TOP VIEW

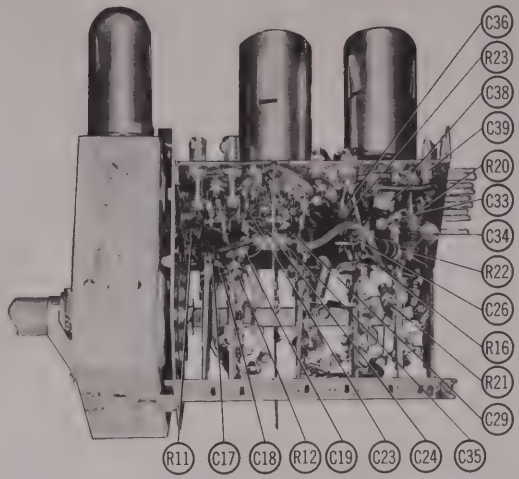


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

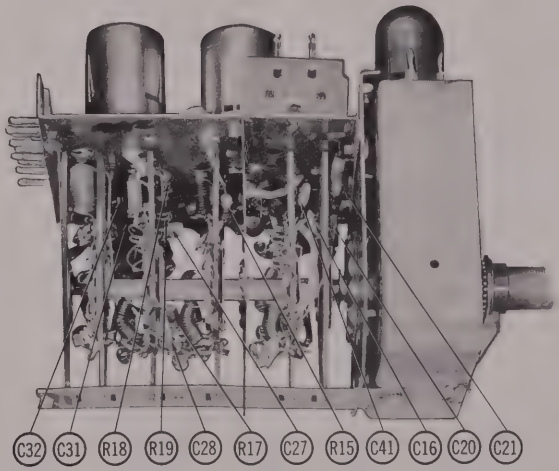
RADIO CHASSIS TOP VIEW



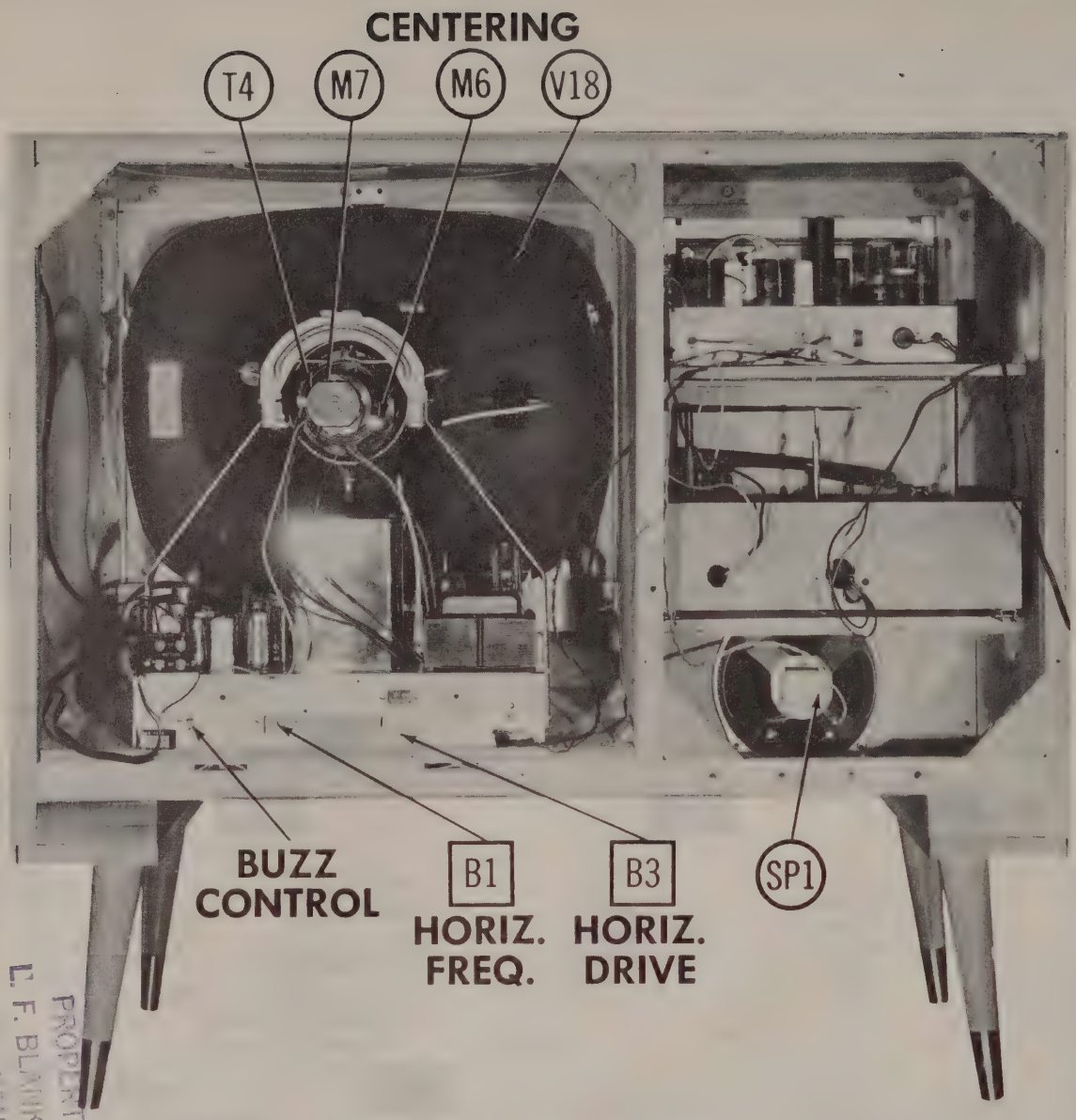
RADIO CHASSIS BOTTOM VIEW



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Connect a short jumper across terminal "C" and "D" of the horizontal oscillator transformer coil (L15).

Set the horizontal hold control fully clockwise. Adjust the horizontal frequency slug (B1) until the picture falls into sync. Remove the jumper from terminals "C" and "D" of L15. Connect the high side of vertical amplifier of scope thru a 5MMF to terminal "C" of L15. Low side to chassis. Adjust the horizontal waveform slug (B2) for a waveform similar to Fig. 7 with broad and narrow peaks of equal height. If necessary during adjustment of B2, keep picture in sync with horizontal hold control or B1.

Remove scope and retouch B1 for the following conditions.

1. At full clockwise position of the horizontal hold control a blanking bar or picture jitter should be evident.

2. At full counter clockwise position of horizontal hold control, picture should lose sync with 4½ to 5 diagonal bars sloping downward to the left. If picture remains in sync at either extreme setting of horizontal hold control, switch off channel and back again so that picture falls out of sync.

   Adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture. If neither of these indications appear, adjust B3 for a picture slightly wider than necessary to fill the picture mask horizontally.

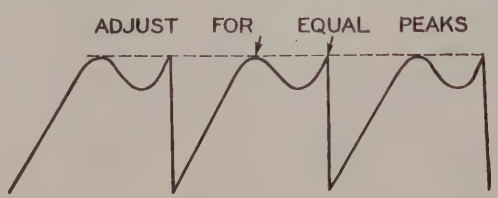
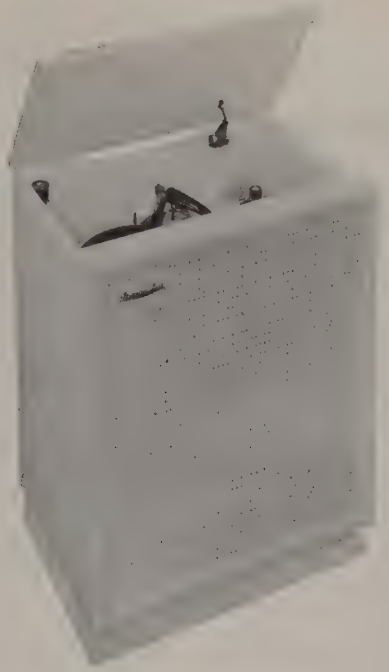


FIG. 7

RETMA MEMBER

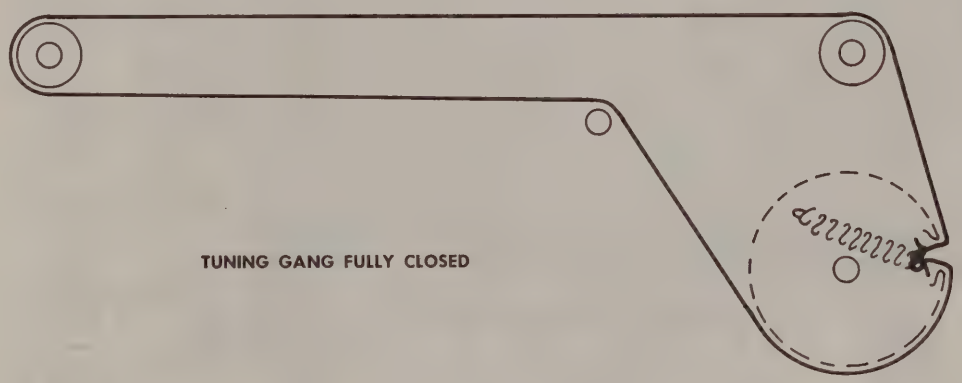
PROPERTY OF
L. F. BLANKENSHIP
3011 Meade St.
DENVER, COLORADO

PACKARD-BELL
MODEL 10RP1



TRADE NAME	Packard-Bell Model 10RP1	
MANUFACTURER	Packard-Bell Co.-Service Div., 11th. & Hope Sts. , Los Angeles 15, California	
TYPE SET	AC Operated FM-AM Superheterodyne Receiver With 3 Speed Automatic Record Changer	
TUBES	Eleven	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .57 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	530KC-1620KC	FREQ. MOD. 88MC-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT 58057 - SEE SIMILAR V-M MODEL 954B - PHOTOFACT SET 302 - FOLDER 12.



DIAL CORD STRINGING

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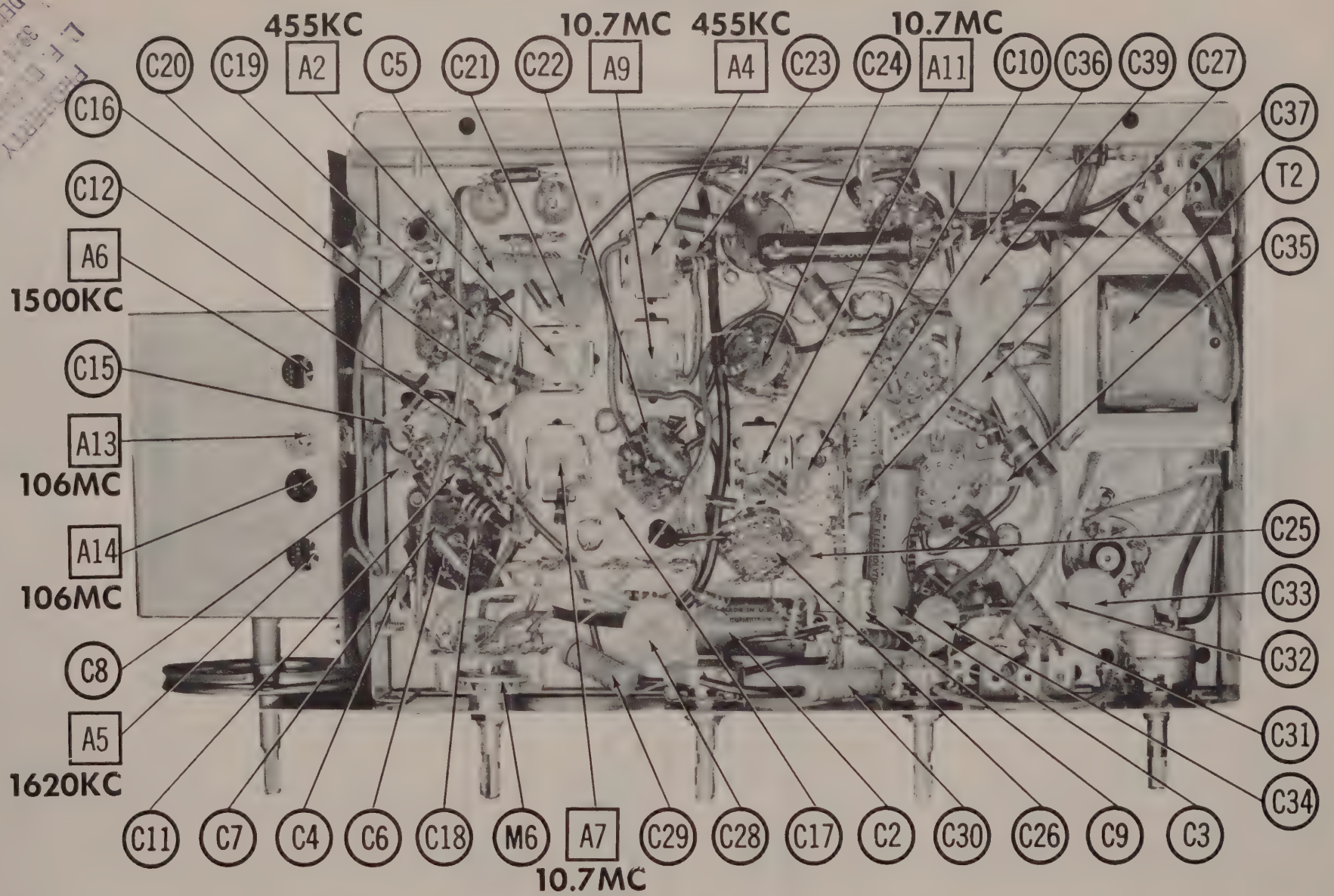
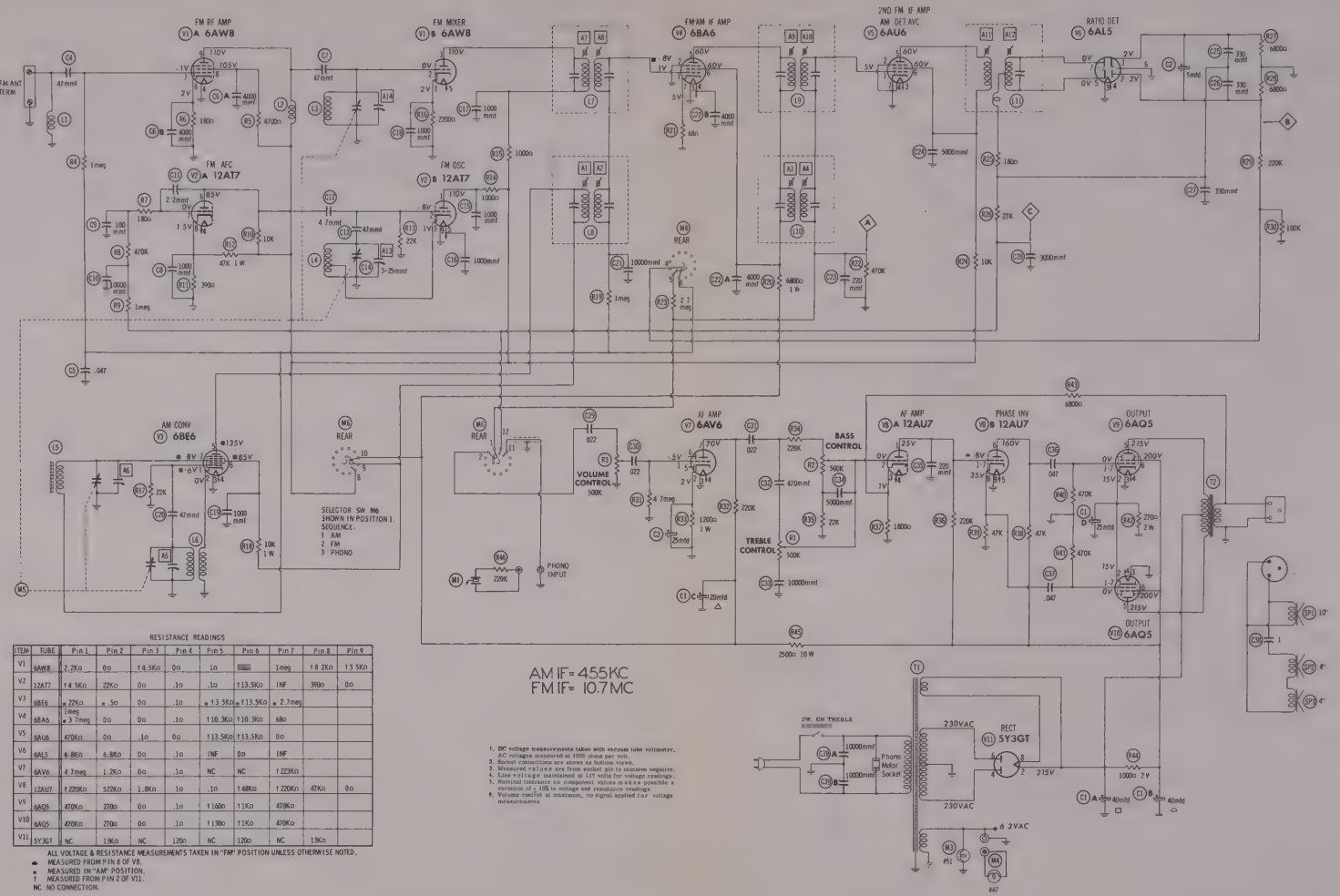


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


FM RF AMP V1 A 6AW8
FM MIXER V1 B 6AW8
FM-AM IF AMP V4 6BA6
2ND FM IF AMP AM DET AVC V5 6AU6
RATIO DET V6 6AL5
FM ANT TERM
FM AFC V2 A 12AT7
FM OSC V2 B 12AT7
REAR
AM CONV V3 6BE6
SELECTOR SW M6 SHOWN IN POSITION 1. SEQUENCE. 1 AM 2 FM 3 PHONO
AF AMP V7 6AV6
VOLUME CONTROL 500K
BASS CONTROL
TREBLE CONTROL 500K
AF AMP V8 A 12AU7
PHASE INV V8 B 12AU7
OUTPUT V9 6AQ5
OUTPUT V10 6AQ5
PHONO INPUT
AM IF = 455KC
FM IF = 10.7MC
SW. ON TREBLE
Phono Motor Socket
230VAC
RECT V11 5Y3GT
6.3VAC

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AW8	2.2KΩ	0Ω	†4.5KΩ	0Ω	.1Ω		1meg	†8.2KΩ	†3.5KΩ
V2	12AT7	†4.5KΩ	22KΩ	0Ω	.1Ω	.1Ω	†13.5KΩ	INF	390Ω	0Ω
V3	6BE6	▲.22KΩ	▲.5Ω	0Ω	.1Ω	▲†3.5KΩ	▲†13.5KΩ	▲2.7meg		
V4	6BA6	1meg ▲3.7meg	0Ω	0Ω	.1Ω	†10.3KΩ	†10.3KΩ	68Ω		
V5	6AU6	470KΩ	0Ω	.1Ω	0Ω	†13.5KΩ	†13.5KΩ	0Ω		
V6	6AL5	6.8KΩ	6.8KΩ	0Ω	.1Ω	INF	0Ω	INF		
V7	6AV6	4.7meg	1.2KΩ	0Ω	.1Ω	NC	NC	†223KΩ		
V8	12AU7	†220KΩ	522KΩ	1.8KΩ	1Ω	.1Ω	†48KΩ	†220KΩ	47KΩ	0Ω
V9	6AQ5	470KΩ	270Ω	0Ω	.1Ω	†160Ω	†1KΩ	470KΩ		
V10	6AQ5	470KΩ	270Ω	0Ω	.1Ω	†130Ω	†1KΩ	470KΩ		
V11	5Y3GT	NC	13KΩ	NC	120Ω	NC	120Ω	NC	13KΩ	

ALL VOLTAGE & RESISTANCE MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE NOTED.
- ▬ MEASURED FROM PIN 8 OF V8.
- ▲ MEASURED IN "AM" POSITION.
- † MEASURED FROM PIN 2 OF V11.

NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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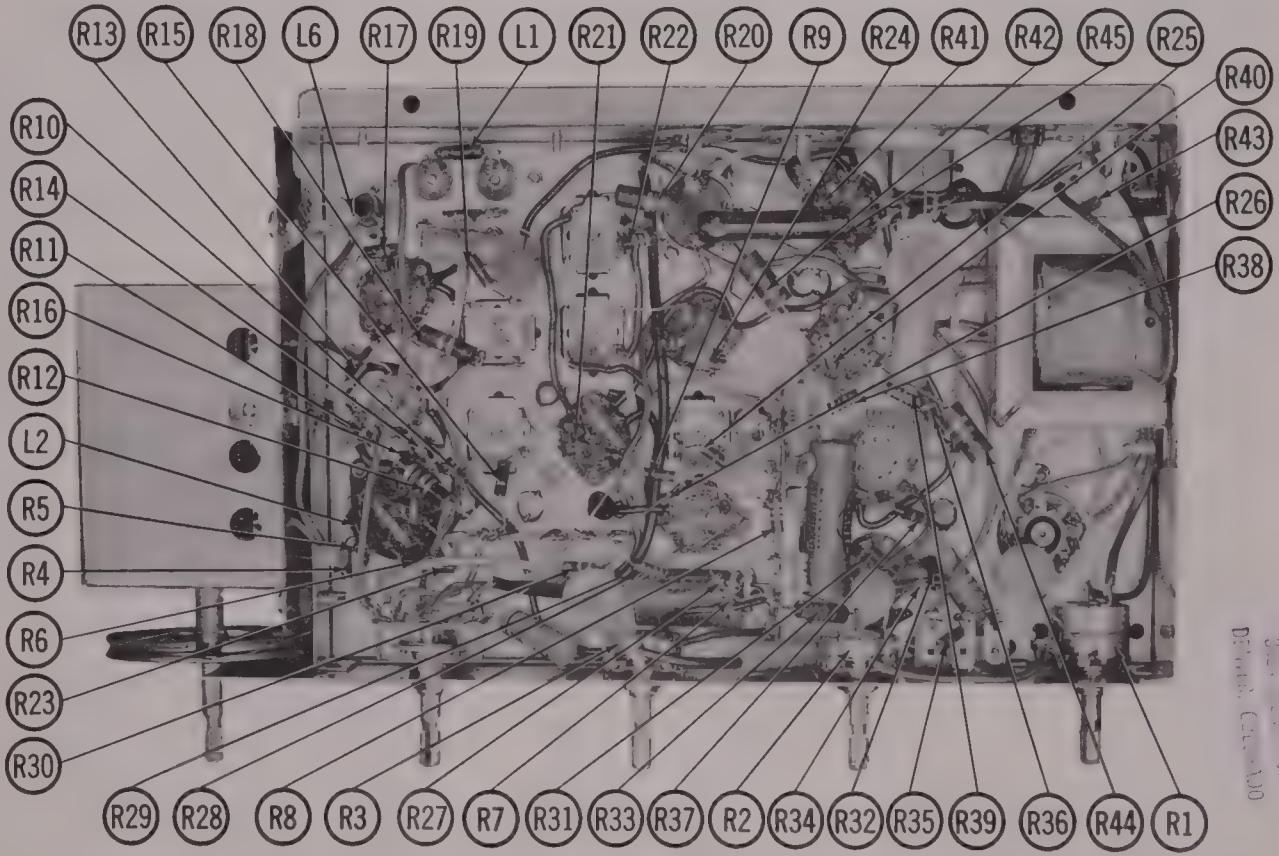
327-7



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400%Mod)	AM	Tuning gang fully closed	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop	1630KC	"	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	"	Tune to 1500KC signal	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 6AW8 (V1). Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully closed	DC probe to point (A). Common to chassis.	A7, A8, A9, A10	Reduce signal generator output to less than one volt at point A and adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A11	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 6AW8 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully closed	Vert. Amp. to point (A). Low side to chassis.	A7, A8, A9, A10	Adjust for maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A11	Disconnect stabilizing capacitor (C3). Adjust for maximum amplitude and symmetry similar to Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A12	Reconnect stabilizing capacitor (C3). Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	150Ω Carbon Resistor	Across FM antenna with 150Ω in each lead.	106MC (Unmod)	FM	106MC	DC probe to point (B). Common to chassis.	A13	Adjust for maximum deflection.
8.	"	"	"	"	"	"	A14	"
9.	"	"	92MC	"	92MC	"	L4	Adjust for maximum deflection by compressing or expanding coil turns.
10.	"	"	"	"	"	"	L3	Adjust for maximum deflection by compressing or expanding coil turns. Repeat steps 7-10 until no further increase can be noticed.

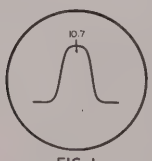


FIG. 1

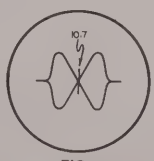


FIG. 2

PROPERTY OF
L.T.S. [illegible] SHIP
[illegible] ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier-FM Mixer	6AW8	
V2	FM AFC-FM Oscillator	12AT7	
V3	AM Converter	6BE6	
V4	FM-AM IF Amplifier	6BA6	
V5	2nd. FM IF Amplifier-AM Det.-AVC	6AU6	

ITEM No.	USE	TYPE	NOTES
V6	Ratio Detector	6AL5	
V7	AF Amplifier	6AV6	
V8	AF Amplifier-Phase Inv.	12AU7	
V9	Output	6AQ5	
V10	Output	6AQ5	
V11	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

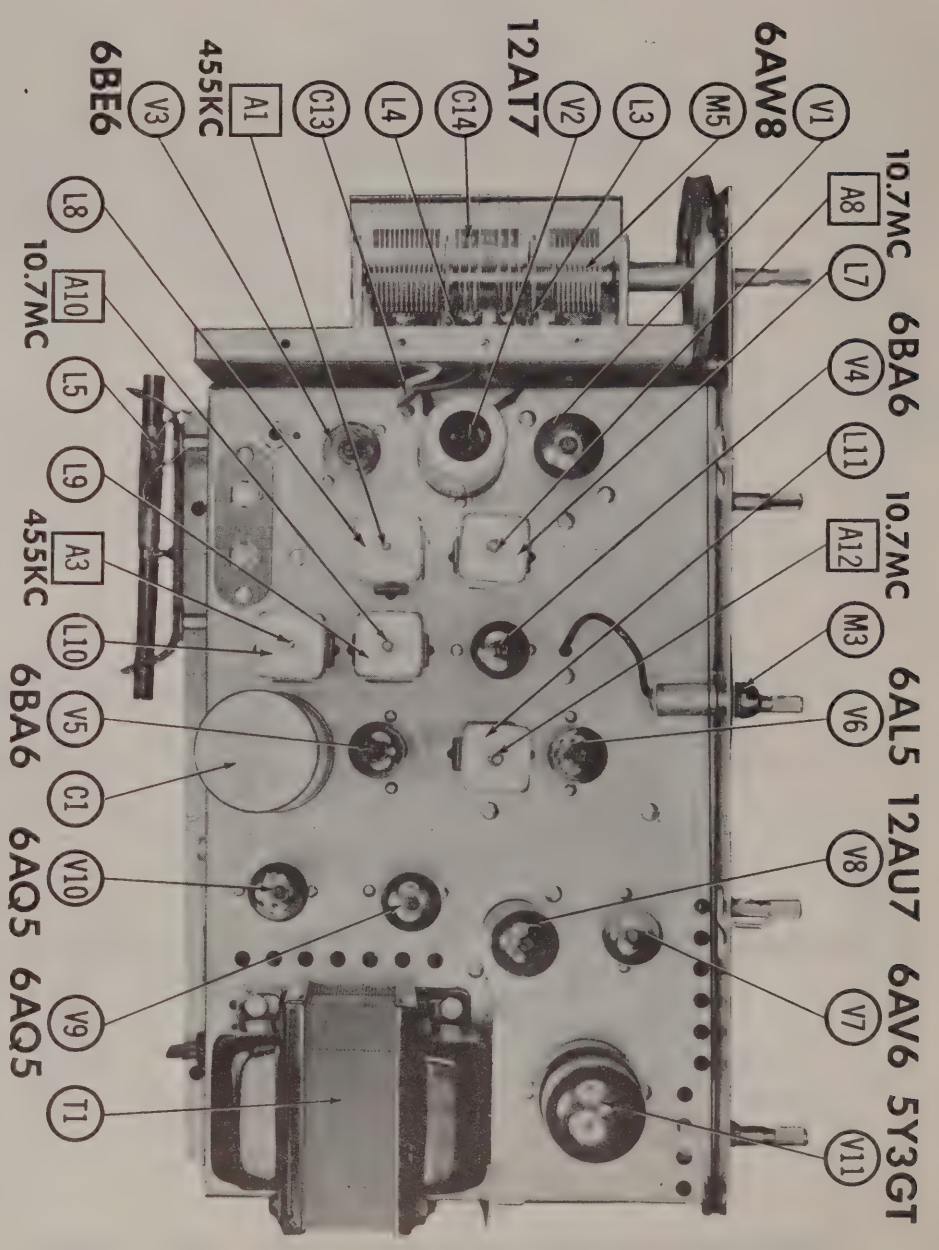
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	350	24092	AFH4-52	D043	FP419.3	TMQ57	Q-215	TVL-4739
B	▲40	350							
C	▲20	350							
D	25	25							
C2	5	50	24038	SRE50V5	BR550	TC30	TD-5-50	MMT-0505	TVA-1303
C3	25	25	24006A	PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	47		23912	DI000047	DD-470	Z033	831-470	ZT-5447	5GA-Q47	
C5	.047	200	23105	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C6A	4000		23955	BPD-2X004	D6-402	DK078	822- 004	DCD-524	5HK-2D4	
B	4000				D6-402					
C7	47		23912							
C8	1000		23965	DI001	DD-102	K069	811-102	DC-521	5GA-D1	
C9	100		23914	NP0-SI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C10	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C11	2.2		23969	NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C12	4.7		23978	NP0-DI4.7	TCZ-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	
C13	47		23912	DI000047	DD-470	Z033	831-470	ZT-5447	5GA-Q47	
C14	5-25		23428		822-AZ					
C15	1000		23965	DI001	DD-102	K069	811-102	DC-521	5GA-D1	
C16	1000		23965	DI001	DD-102	K069	811-102	DC-521	5GA-D1	
C17	1000		23965	DI001	DD-102	K069	811-102	DC-521	5GA-D1	
C18	1000		23965	DI001	DD-102	K069	811-102	DC-521	5GA-D1	
C19	1000		23965	DI001	DD-102	K069	811-102	DC-521	5GA-D1	
C20	47		23912							
C21	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C22A	4000		23955	BPD-2X004	D6-402	DK078	822- 004	DCD-524	5HK-2D4	
B	4000				D6-402					
C23	220		23915	DI00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C24	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C25	330		23944	DI00033	DD-331	5R5T33	811-331		MS-333	
C26	330		23944	DI00033	DD-331	5R5T33	811-331		MS-333	
C27	330		23944	DI00033	DD-331	5R5T33	811-331		MS-333	
C28	3000		23985	1464-003		1R5D3		MCB461	MS-23	
C29	.022	200	23103	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C30	.022	200	23103	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C31	.022	400	23122	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C32	470		23916	BPD-00047	DD-471	G060	811-471	UC-5347	5GA-T47	
C33	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C34	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	220		23915	DI00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C36	.047	400	23124	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C37	.047	400	23124	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C38	.1	100	23040	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C39A	10000	125VAC	23982A	DAC-27	DD-1032	CUB16S1		PT1611	10HK-S1	
B	10000			DAC-27	DD-1032	CUB16S1		PT1611	10HK-S1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	25039	AB-60	A47-500K-Z	Q13-133	U-48	Treble
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A
R2A	500KΩ	½	25038	AB-60	A47-500K-Z	Q13-133	U-48	Bass
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	25038	AB-60	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Packard-Bell PART No.	IRC PART No.	
R4	1Meg		73161	BTS-1Meg	
R5	4700Ω		73033	BTS-4700	
R6	180Ω		73016	BTS-180	
R7	180Ω		73016	BTS-180	
R8	470KΩ		73157	BTS-470K	
R9	1Meg		73161	BTS-1Meg	
R10	10KΩ		73037	BTS-10K	
R11	390Ω		73020	BTS-390	
R12	47KΩ	1	73245	BTA-47K	
R13	22KΩ		73041	BTS-22K	
R14	1000Ω		73025	BTS-1000	
R15	1000Ω		73025	BTS-1000	
R16	2200Ω		73029	BTS-2200	
R17	22KΩ		73041	BTS-22K	
R18	10KΩ	1	73037	BTA-10K	
R19	1Meg		73161	BTS-1Meg	
R20	6800Ω	1	73235	BTA-6800	
R21	68Ω		73011	BTS-68	
R22	470KΩ		73157	BTS-470K	
R23	2.2Meg		73165	BTS-2.2Meg	
R24	10KΩ		73037	BTS-10K	
R25	180Ω		73016	BTS-180	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Packard-Bell PART No.	IRC PART No.	
R26	27KΩ		73042	BTS-27K	
R27	6800Ω		73035	BTS-6800	
R28	6800Ω		73035	BTS-6800	
R29	220KΩ		73153	BTS-220K	
R30	100KΩ		73149	BTS-100K	
R31	4.7Meg		73169	BTS-4.7Meg	
R32	220KΩ		73153	BTS-220K	
R33	1200Ω	1	73026	BTA-1200	
R34	220KΩ		73153	BTS-220K	
R35	22KΩ		73041	BTS-22K	
R36	220KΩ		73153	BTS-220K	
R37	1800Ω		73028	BTS-1800	
R38	47KΩ		73045	BTS-47K	
R39	47KΩ		73045	BTS-47K	
R40	470KΩ		73157	BTS-470K	
R41	470KΩ		73157	BTS-470K	
R42	270Ω	2	73418	BTB-270	
R43	6800Ω		73035	BTS-6800	
R44	1000Ω	2	73425	BTB-1000	
R45	2500Ω	10	73637	PW10-2500	
R46	220KΩ		73153	BTS-220K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.57A	475VCT @.075A	5VAC @2A	6.3VAC @3.75A	89055	P9206		PC8404①		R-10A

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7.2KΩ	6-8Ω	89460	Z1007 ①	A-2904 ①	A-3870	~~T2853~~	S-55X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	RCA TYPE No.	
SP1	10"	PM	6-8Ω	83708	10A6A	21581	
SP2	4"	PM	6-8Ω	83110	4A07T		
SP3	4"	PM	6-8Ω	83111	4A07T		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	RF Choke	.2Ω		29124	19-1000		4602	1 Microhenry
L2	RF Choke	.2Ω		29124	19-1000		4602	1 Microhenry
L3	FM RF Coil	0Ω		29118				
L4	FM Osc. Coil	0Ω		29221				Tapped
L5	AM Loop Stick	1.6Ω		29352				
L6	AM Osc. Coil	.6Ω	7.8Ω	29229	14-1077			
L7	1st. FM IF	1.4Ω	1.4Ω	29071	16-3487	FM-254	1463	
L8	1st. AM IF	15Ω	15Ω	29066	16-6758	BC-352	12-C1	
L9	2nd. FM IF	1.4Ω	1.4Ω	29072	16-3487	FM-254	1463	
L10	2nd. AM IF	16Ω	16Ω	29067	16-6758	BC-353	12-C2	
L11	Ratio Detector	2.4Ω	.3ΩCT	29073	17-3498	FM-252	1465	Tertiary winding-4Ω

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Packard-Bell PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	63034	55-T	GD-J	47	0-1 or S-1 & 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	Packard-Bell PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		*S-67 or † S-66 or ♦ † S-66SD or ♦S-66D	†AC-434 or ♦†AC-434D1 or †♦ AC-434D2 or ♦AC-434D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M3	Dial Light	54006	#51
M4	Pilot Light	54002	#47
M5	Tuning Cap.	23542	4 Gang (AM Sections: 41-495MMF, 18-180MMF)
M6	Switch	86048A	Phono-FM-AM (3 Pole - 3 Position, Rotary, wafer type)
	Cabinet	10RP1	Specify finish
	Knob	52116	Volume & tuning
	Knob	52117	On-off-treble, bass & phono-AM-FM switch
	Dial Pointer	67041	

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L. F. ELECTRONICS
3924 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
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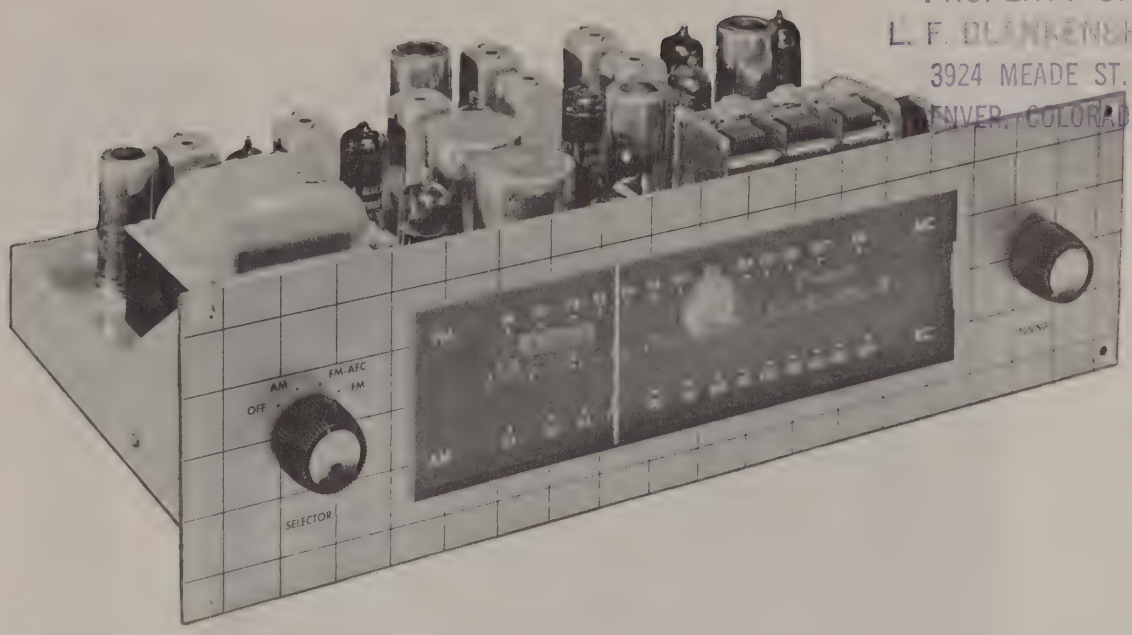
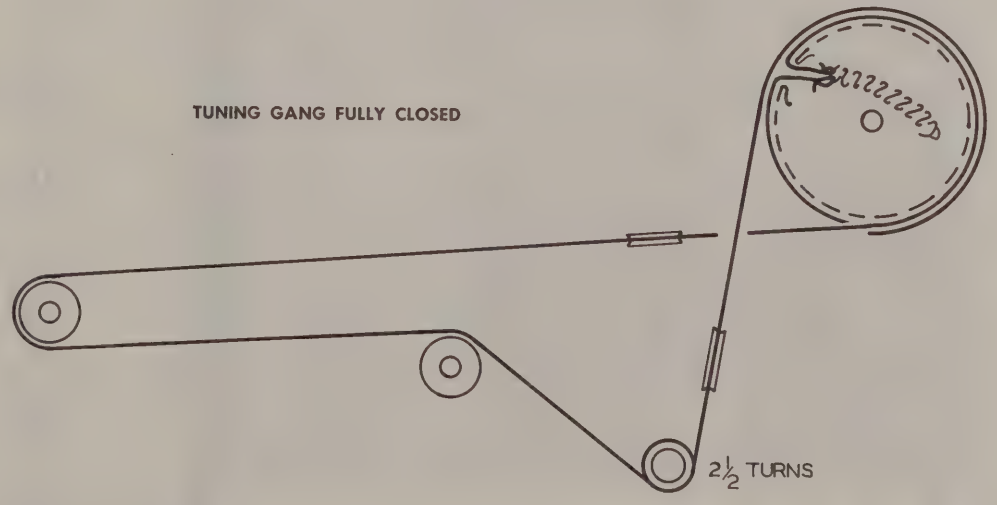
PEDERSEN
MODEL AFM-2A



TRADE NAME	Pedersen Model AFM-2A	
MANUFACTURER	Pedersen Electronics, P.O. Box 572, Lafayette , California	
TYPE SET	AC Operated FM-AM Superheterodyne Tuner	
TUBES	Thirteen	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .64 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	535KC-1625KC	FREQ. MOD. 88-108MC

PEDERSEN
MODEL AFM-2A



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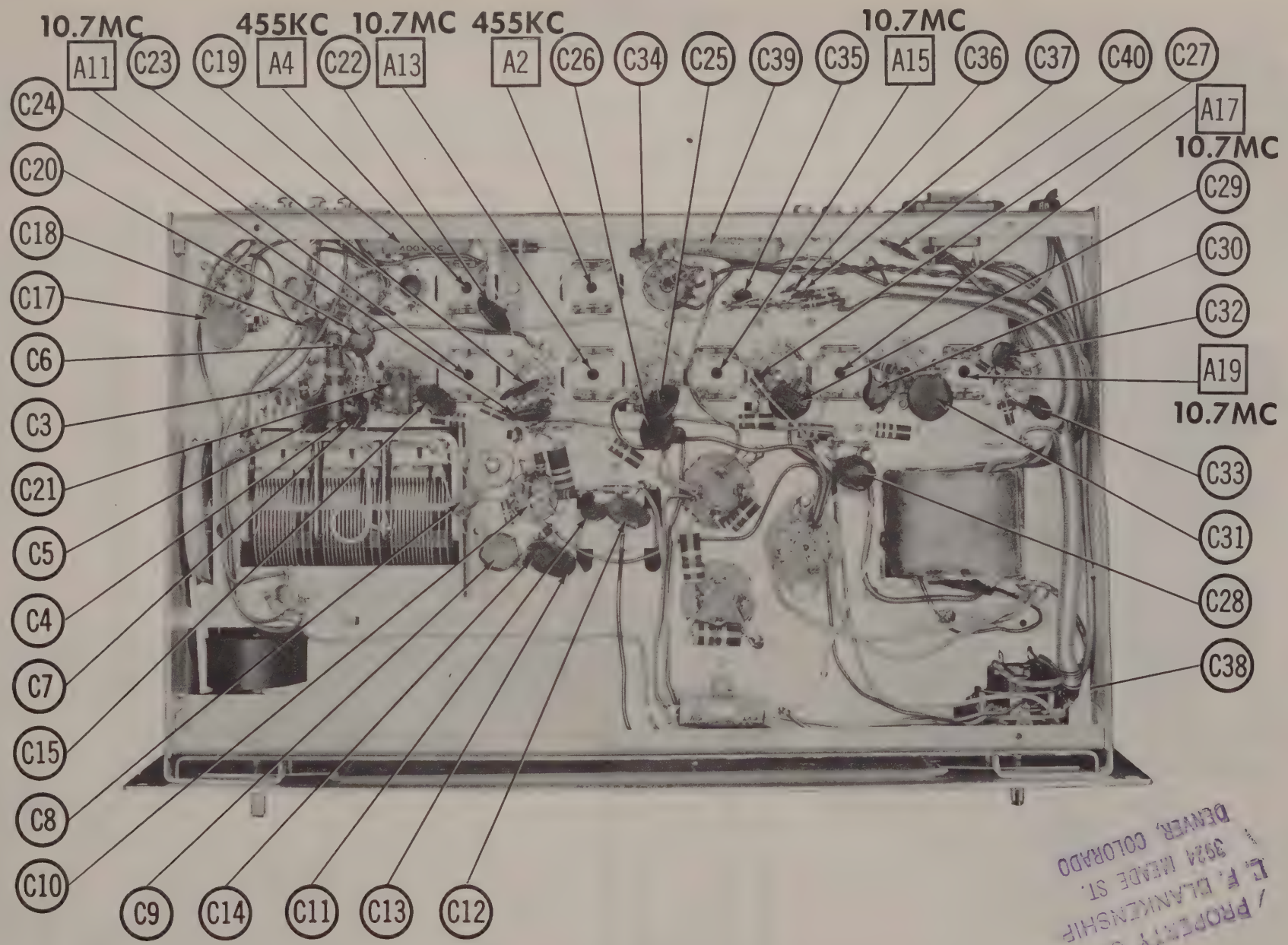

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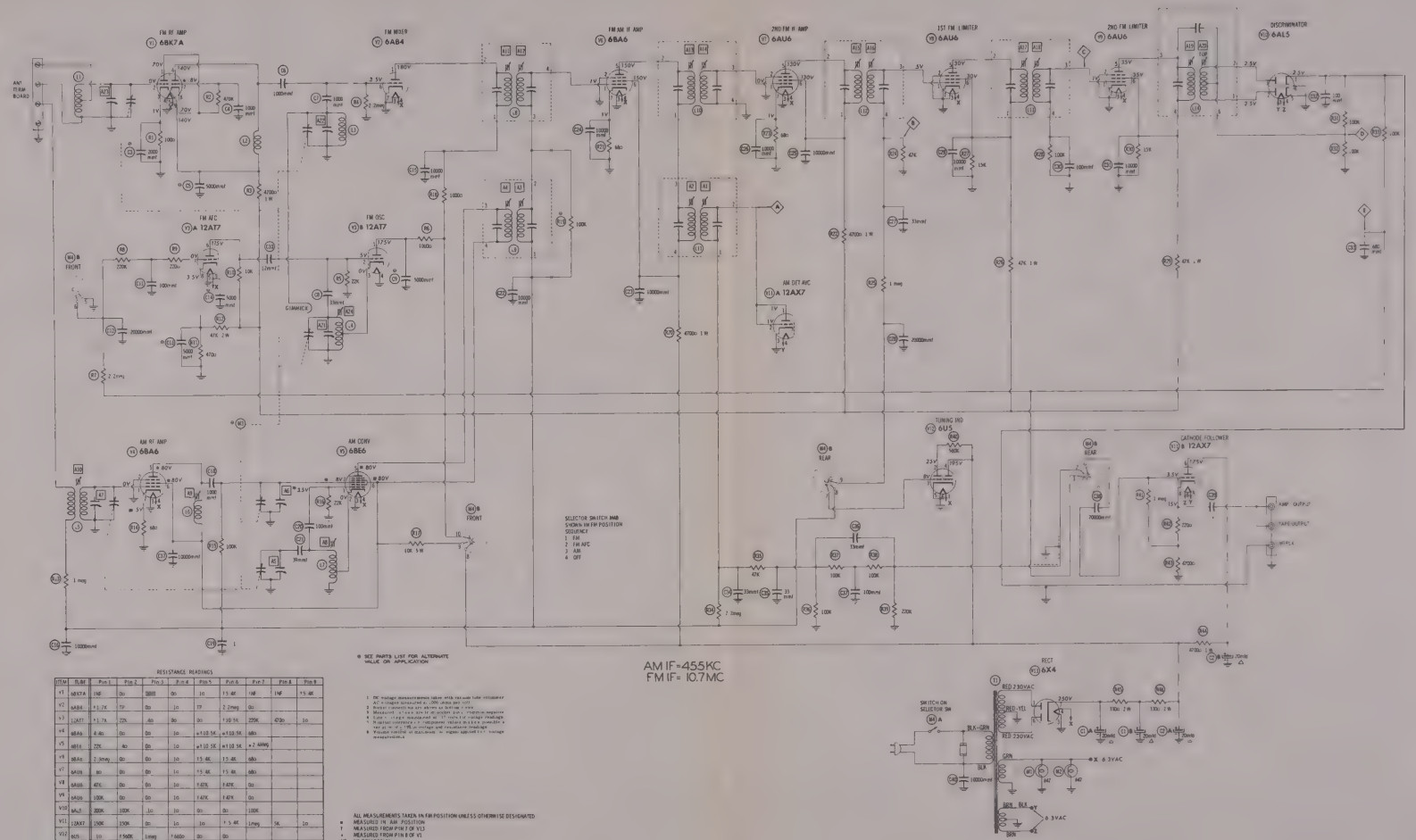
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	1MΩ	0Ω	300Ω	0Ω	1Ω	15.4K	1MΩ	1MΩ	15.4K
V2	6AB4	11.7K	TP	0Ω	1Ω	TP	2.2meg	0Ω		
V3	12AT7	11.7K	72K	4Ω	0Ω	0Ω	110.5K	225K	470Ω	1Ω
V4	6BA6	4.4Ω	0Ω	0Ω	1Ω	∞ 10.5K	∞ 10.5K	68Ω		
V5	6BE6	72K	4Ω	0Ω	1Ω	∞ 10.5K	∞ 10.5K	∞ 7.4MΩ		
V6	6BA6	2.2meg	0Ω	0Ω	1Ω	15.4K	15.4K	68Ω		
V7	6AU6	1Ω	0Ω	0Ω	1Ω	15.4K	15.4K	68Ω		
V8	6AU6	47K	0Ω	0Ω	1Ω	7.47K	7.47K	0Ω		
V9	6AU6	100K	0Ω	0Ω	1Ω	7.47K	7.47K	0Ω		
V10	6AL5	220K	100K	1Ω	1Ω	0Ω	0Ω	100K		
V11	12AX7	150K	250K	0Ω	1Ω	1Ω	15.4K	1meg	5K	1Ω
V12	6U5	1Ω	1.560K	1meg	7.660Ω	0Ω	0Ω			
V13	6X4	140Ω	NC	0Ω	1Ω	NC	170Ω	14K		

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED
∞ MEASURED IN AM POSITION
† MEASURED FROM PIN 7 OF V13
* MEASURED FROM PIN 8 OF V1
NC NO CONNECTION
TP TIE POINT

1 DC voltage measurements taken with vacuum tube voltmeter
A/C voltages measured at 120V cross pin 1 to 7
2 Resistor elements not shown as battery drain
3 Measured values are from chassis point to socket terminal
4 Voltages measured in FM position with no signal input
5 Against ground with a 1 megohm resistor shunted across a vacuum tube voltmeter
6 Values marked ∞ may read higher or lower depending upon individual tube characteristics

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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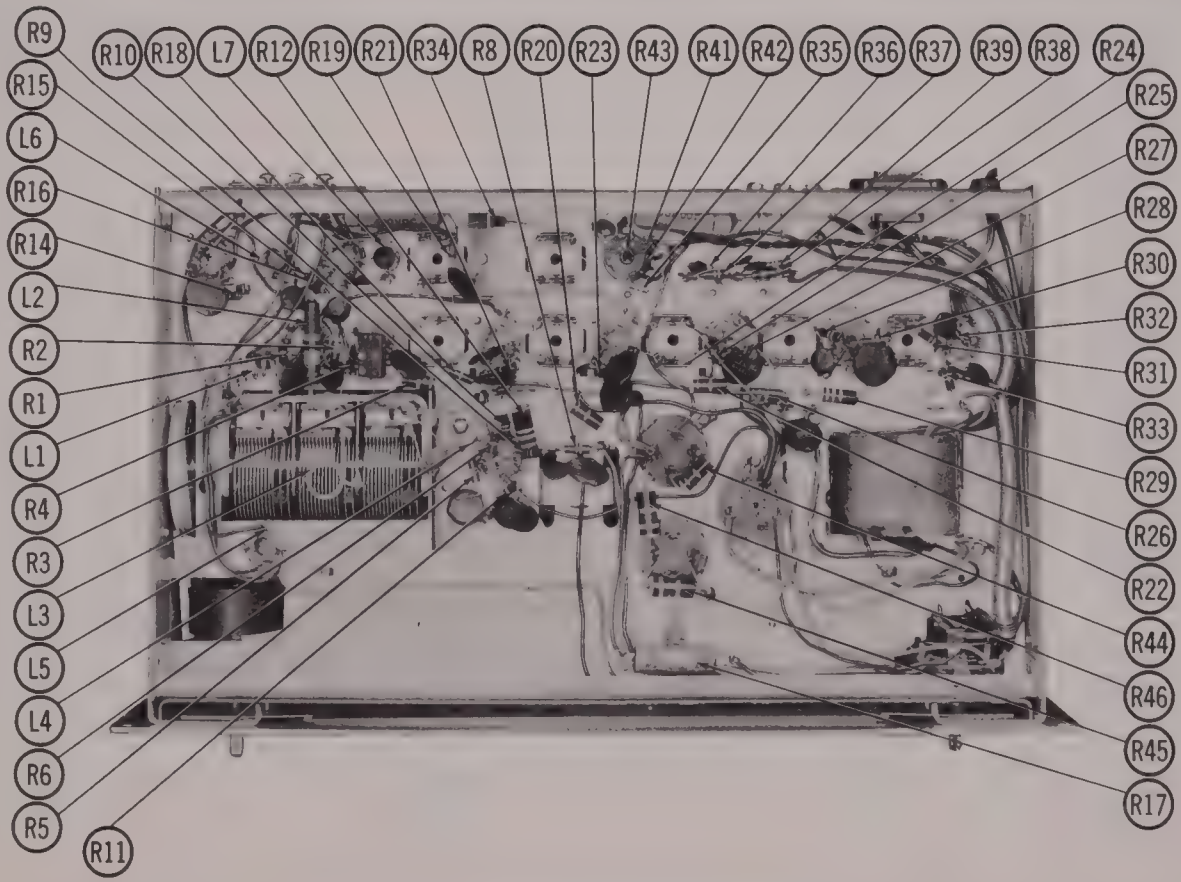

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow 15 minute warm-up period for receiver and equipment. With tuning gang fully closed set pointer just to the right of "0" on logging scale. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400 Mod)	AM	Tuning gang fully open	DC probe to point (X). Common to Chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	High side thru 200MMF to AM antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5, A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9, A10	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (X). Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (Y). Common to chassis.	A17, A18	"
6.	"	"	"	"	"	DC probe thru 1Meg to point (Z). Common to chassis.	A19	"
7.	"	"	"	"	"	DC probe to point (X). Common to chassis.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (X). Low side to chassis.	A11, A12, A13, A14, A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (Y). Low side to chassis	A17, A18	"
6.	"	"	"	"	"	Vert. Amp. thru 22K Ω to point (Z). Low side to chassis.	A19	"
7.	"	"	"	"	"	Vert. Amp. to point (X). Low side to chassis.	A20	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A19 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	105MC (Unmod)	FM	105MC	DC probe to point (X). Common to chassis.	A21, A22 A23	Adjust for maximum deflection.
9.	"	"	90MC	"	90MC	"	A24	Adjust for maximum deflection. Repeat steps 8 and 9 until no further improvement can be obtained. Replace bottom cover. Check 90MC reading. If necessary, readjust A24.

FIG. 1

FIG. 2

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E. F. BLANKENSHIP
3924 MILDE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BK7A	
V2	FM Mixer	6AB4	
V3	FM Osc.-AFC	12AT7	
V4	AM RF Amplifier	6BA6	
V5	AM Converter	6BE6	
V6	FM-AM IF Amplifier	6BA6	
V7	2nd. FM IF Amplifier	6AU6	

ITEM No.	USE	TYPE	NOTES
V8	1st. FM Limiter	6AU6	
V9	2nd. FM Limiter	6AU6	
V10	Discriminator	6AL5	
V11	AM Det.-Cathode Follower	12AX7	
V12	Tuning Indicator	6U5	
V13	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PEDERSEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	350		AFH4-03	D009	FP434	TMQ5	Q-030	TVL-4760
B	▲20	350							
C2A	▲20	350							
B	▲20	350							

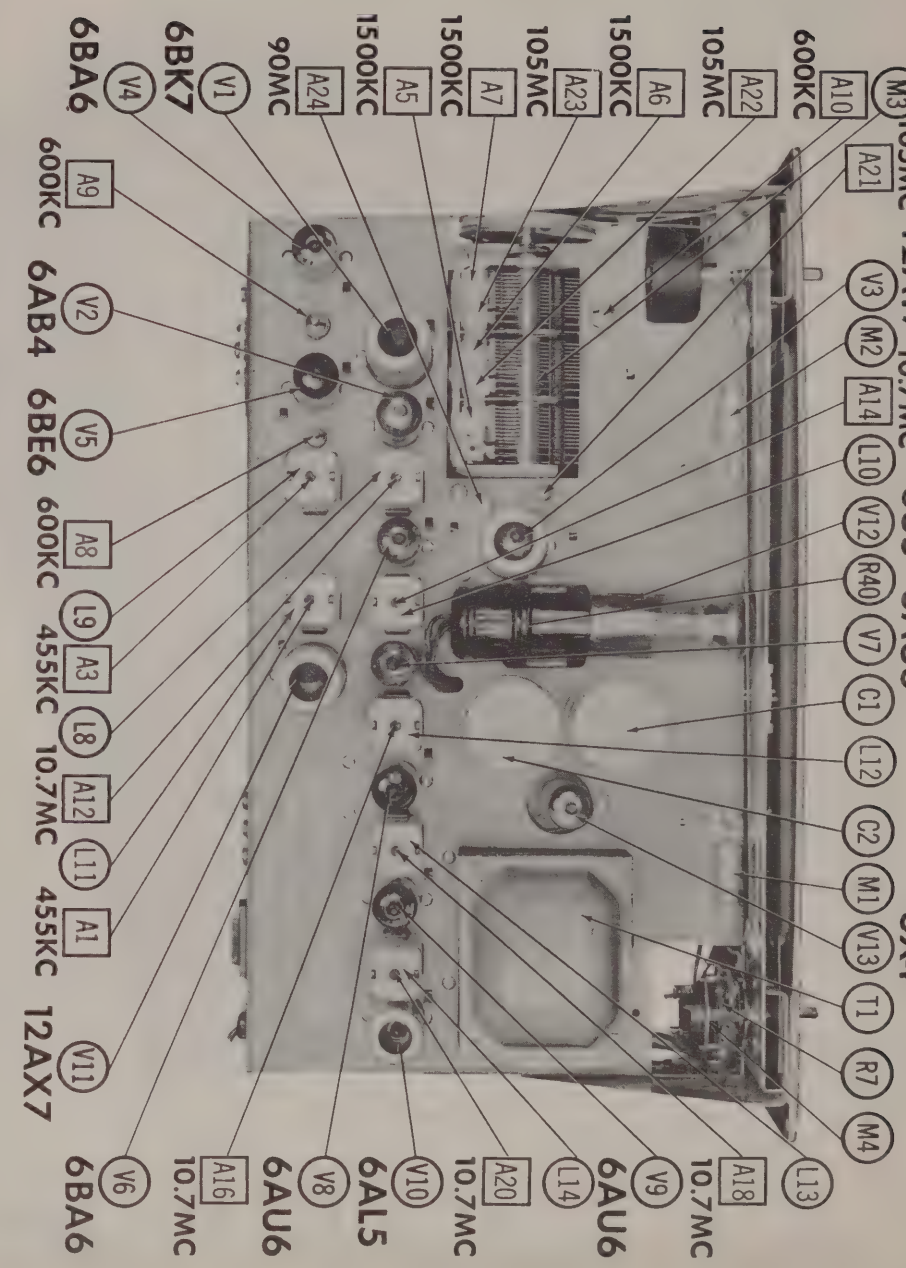
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PEDERSEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	Note 1
C4	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C5	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 2
C6	1000			DI001	DD-102	G069	811-102	UC-521	5GA-D1	
C7	1000			DI001	DD-102	G069	811-102	UC-521	5GA-D1	
C8	33			NP0-DI33	TCZ-33	G029	831-330	UC-5433	5GA-Q33	
C9	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 2
C10	12			N750-SI10	TCN-12	TN02	N750K-120	NT-541	5TCU-Q1	
C11	100			BPD-0001	DD-101	G042	801-001	UC-531	5GA-T1	
C12	20000			BPD-02	DD-203	K085	817-02	PT412	5HK-S2	
C13	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 2
C14	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C15	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C17	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	1000			BPD-001	DD-102	K069	801-001	UC-521	5HK-D1	
C19	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C20	100			NP0-DI100	DD-101	G042	801-101	UC-531	5GA-T1	
C21	39	500		NP0-DI39	TCZ-39	22R5Q39	NP0L-390		MS-439	
C22	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C23	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C24	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C25	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C26	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C27	33			BPD-000033	DD-330	G029	831-330	UC-5433	5GA-Q33	
C28	20000			BPD-02	DD-203	K085	817-02	PT412	5HK-S2	
C29	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C30	100			BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C31	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C32	100			BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C33	680			BPD-00068	DD-681	K065	811-681	UC-5368	5GA-T68	
C34	33			BPD-000033	DD-330	G029	831-330	UC-5433	5GA-Q33	
C35	33			BPD-000033	DD-330	G029	831-330	UC-5433	5GA-Q33	
C36	33			BPD-000033	DD-330	G029	831-330	UC-5433	5GA-Q33	
C37	100			BPD-0001	DD-101	G042	801-001	UC-531	5GA-T1	
C38	20000			BPD-02	DD-203	K085	817-02	PT412	5HK-S2	
C39	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C40	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

Note 1. Some versions may use 1000MMF in this application.
Note 2. Some versions may use 10000MMF in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PEDERSEN PART No.	IRC PART No.	
R1	100Ω			BTS-100	
R2	470KΩ			BTS-470K	
R3	4700Ω	1		BTA-4700	
R4	2.2Meg			BTS-2.2Meg	
R5	22KΩ			BTS-22K	
R6	1000Ω			BTS-1000	
R7	2.2Meg			BTS-2.2Meg	
R8	220KΩ			BTS-220K	
R9	220Ω			BTS-220	
R10	10KΩ			BTS-10K	
R11	470Ω			BTS-470	
R12	47KΩ	2		BTB-47K	
R13	1Meg			BTS-1Meg	
R14	68Ω			BTS-68	
R15	100KΩ			BTS-100K	
R16	22KΩ			BTS-22K	
R17	10KΩ	5		PW10-10K	
R18	1000Ω			BTS-1000	
R19	100KΩ			BTS-100K	Note 1
R20	4700Ω	1		BTA-4700	
R21	68Ω			BTS-68	
R22	4700Ω	1		BTA-4700	
R23	68Ω			BTS-68	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PEDERSEN PART No.	IRC PART No.	
R24	47KΩ			BTS-47K	
R25	1Meg			BTS-1Meg	
R26	47KΩ	1		BTA-47K	
R27	15KΩ			BTS-15K	
R28	100KΩ			BTS-100K	
R29	47KΩ	1		BTA-47K	
R30	15KΩ			BTS-15K	
R31	100KΩ			BTS-100K	
R32	100KΩ			BTS-100K	
R33	100KΩ			BTS-100K	
R34	2.2Meg			BTS-2.2Meg	
R35	47KΩ			BTS-47K	
R36	100KΩ			BTS-100K	
R37	100KΩ			BTS-100K	
R38	100KΩ			BTS-100K	
R39	220KΩ			BTS-220K	
R40	560KΩ			BTS-560K	
R41	1Meg			BTS-1Meg	
R42	220Ω			BTS-220	
R43	4700Ω			BTS-4700	
R44	4700Ω	1		BTA-4700	
R45	330Ω	2		BTB-330	
R46	330Ω	2		BTB-330	

Note 1. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PEDERSEN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .64A	465VCT @ .070A	6.3VAC @ 4.1A	6.3VCT @ .60A						

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PEDERSEN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		FM-201				Tapped
L2	RF Choke	5.8Ω						5.5 Microhenries, IRC part #CLA
L3	FM RF Coil	0Ω		FM-202				
L4	FM Osc. Coil	0Ω		FM-203				Tapped
L5	AM Ant. Coil	1.1Ω	4.4Ω	WC-418	14-1075			
L6	AM RF Coil	4.2Ω		WC-419				
L7	AM Osc. Coil	4Ω		WC-420			70-OSC	Tapped @ .4Ω
L8	1st. FM IF	.6Ω	.6Ω	1607-2	16-3487	FM-254	1463	
L9	1st. AM IF	25Ω	25Ω	1655-11 *	16-6758	BC-352	12-C1	
L10	2nd. FM IF	.6Ω	.6Ω	1607-2	16-3487	FM-254	1463	
L11	2nd. AM IF	25Ω	25Ω	1655-11 *	16-6758	BC-353	12-C2	
L12	3rd. FM IF	.6Ω	.6Ω	1607-2	16-3487	FM-254	1463	
L13	FM Limiter	.6Ω	.6Ω	1607-2	16-3487	FM-254	1463	
L14	Discriminator	.6Ω	.9ΩCT		17-3494	FM-253	1464	

* Used in versions with serial numbers below 5500, for serial numbers above 5500 part #1655-6 is used.

MISCELLANEOUS

ITEM No.	PART NAME	PEDERSEN PART No.	NOTES
M1	Dial Light		#47
M2	Dial Light		#47
M3	Tuning Cap.	3352 *	6 Gang (AM sections: 23-340MMF, 22-340MMF, 27-340MMF)
M4A	Switch	8-111A	Off (power) SPST
B	Switch		Selector (Rotary, wafer type)

* Used in versions with serial numbers below 5500Ω For serial numbers above 5500 part # 3563 is used.

RETMA MEMBER

PEDERSEN MODEL W-50

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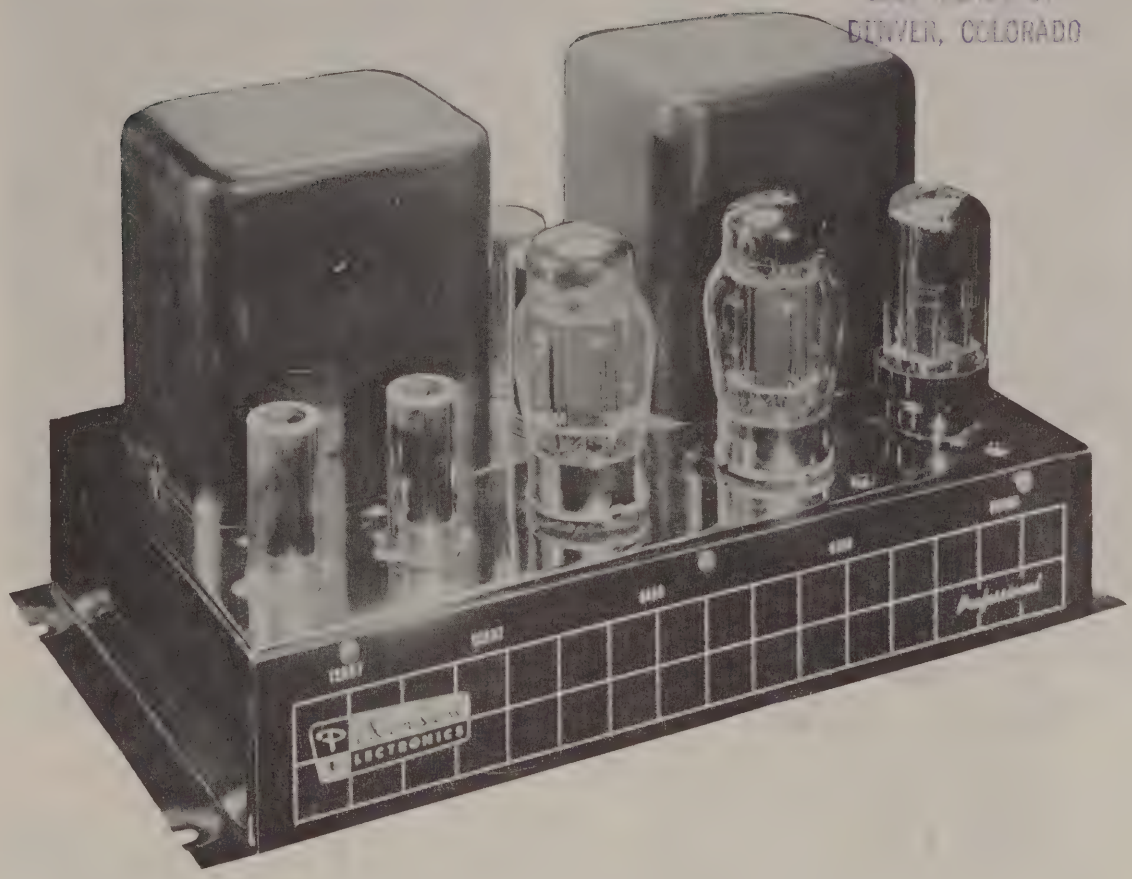
PEDERSEN
MODEL W-50



PEDERSEN
MODEL W-50

TRADE NAME	Pedersen Model W-50
MANUFACTURER	Pedersen Electronics, P. O. Box 572, Lafayette, Calif.
TYPE SET	AC Operated Audio Amplifier
TUBES (Five)	Types 12AU7 AF Amp. -Phase Inv., 12AU7 Driver, (2) 6550 Output, 5U4GB Rectifier
POWER SUPPLY	105 (or) 125 Volts AC-60 Cycles RATING 1.16 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

PEDERSEN Model W-50

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AU7	
V2	Driver	12AU7	
V3	Output	6550	
V4	Output	6550	
V5	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PEDERSEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲ 20	500	Note 1	AFH2-69	B050	FP284	TMD61	D-270	R1617 *
B	▲ 20	500	Note 1						
C2A	▲ 20	500		AFH2-69	B050	FP284	TMD61	D-270	R1617 *
B	▲ 20	500							
C3	8	150		PRS150V8	BR815	TC41	TD-8-150	FM-1508	TVA-1405
C4A.	30	450		PRS450V3030	BBRD3345	TC77	TDLD-29	FMD-4530	TVA-2735
B	30	450				TC77			

Note 1. In some versions, C1 is a single 40MFD unit.
* Unit must be ordered from manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PEDERSEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	820			SI820	DD-821	K067	811-821	DC-521	5GA-T82	
C6	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C7	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C8	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C9	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PEDERSEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	28-506A	AB-59	A47-500K-Z	Q13-133	U48	Gain
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
R2A	100Ω	4	21-010-529	SVP-983	A10-100	WPK100	M100PK	Damping-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-½	Not Req.	Not Req.	Attach to R2A.
R3A	100Ω	4	21-010-529	SVP-983	A10-100	WPK100	M100PK	Hum Balance-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-½	Not Req.	Not Req.	Attach to R3A.
R4A	15KΩ	4	21-010-596	SVP-996	A10-15K	WPK15000	M15MPK	Bias Balance-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-½	Not Req.	Not Req.	Attach to R4A.

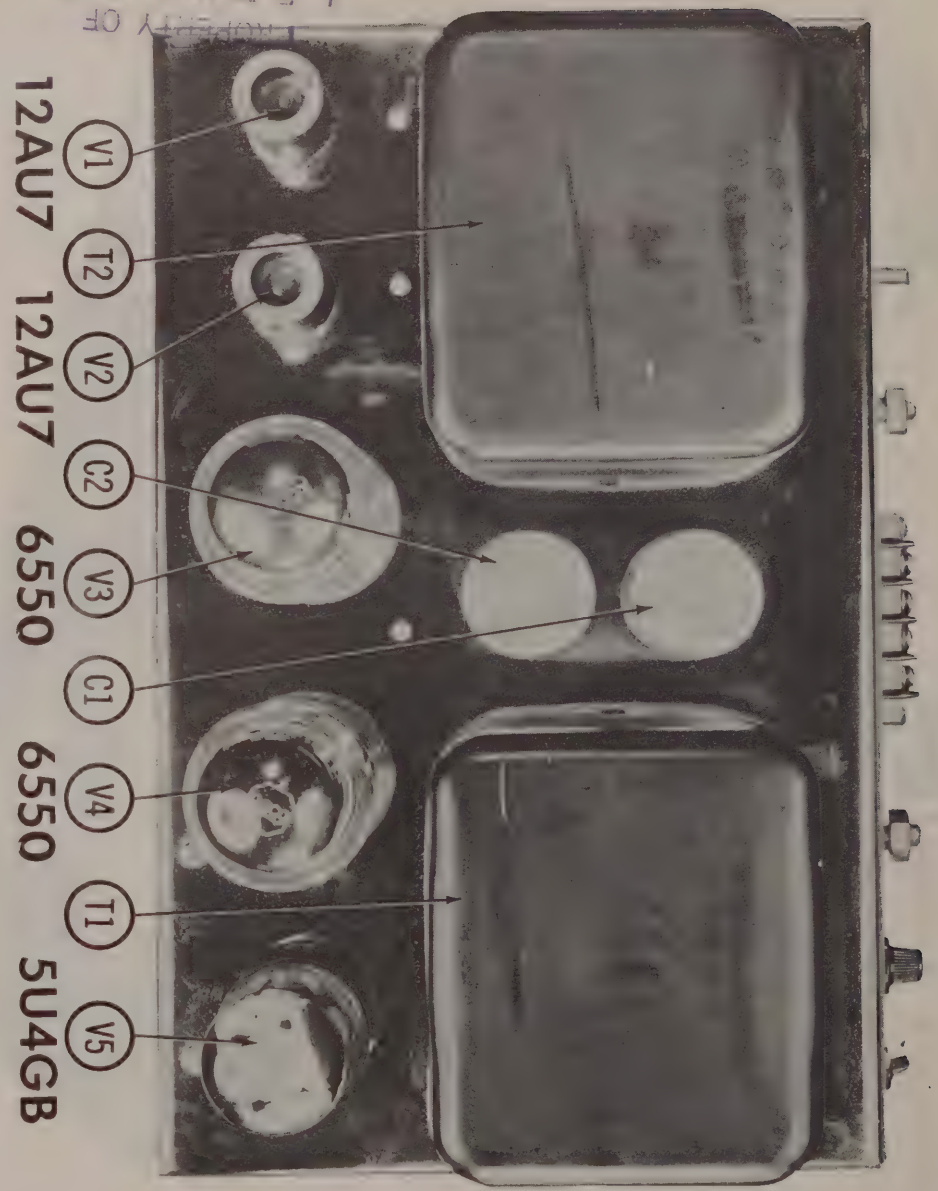
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PEDERSEN PART No.	IRC PART No.	NOTES
R5	470KΩ			BTS-470K	
R6	33KΩ			BTS-33K	
R7	100KΩ	1		BTA-100K	
R8	470Ω			BTS-470	
R9	68Ω			BTS-68	
R10	470Ω	2		BTB-470	
R11	68Ω			BTS-68	
R12	68Ω			BTS-68	
R13	47KΩ			BTS-47K	
R14	22KΩ			BTS-22K	
R15	47KΩ			BTS-47K	
R16	470KΩ			BTS-470K	
R17	47KΩ	2		BTB-47K	
R18	1000Ω			BTS-1000	
R19	470KΩ			BTS-470K	
R20	47KΩ	2		BTB-47K	
R21	1000Ω			BTS-1000	
R22	100KΩ			BTS-100K	
R23	100KΩ			BTS-100K	
R24	1000Ω			BTS-1000	
R25	.287Ω				Note 1
R26	4700Ω	1		BTA-4700	
R27	10KΩ	9		PW10-10K	

Note 1. This resistor consists of a special length of resistance wire.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PEDERSEN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ L 16A Tap @ 105VAC	800VCT @ .140A 112V * @ .0061A	5VAC @ 3A	6.3VAC @ 3.5A	50-59					

* Bias tap on HV winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PEDERSEN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3.5KΩ	16Ω Tap @ 8Ω Tap @ 4Ω	51-59						

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PEDERSEN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.0061A		1159	RS050	8S20	8Y1	50	

FUSES

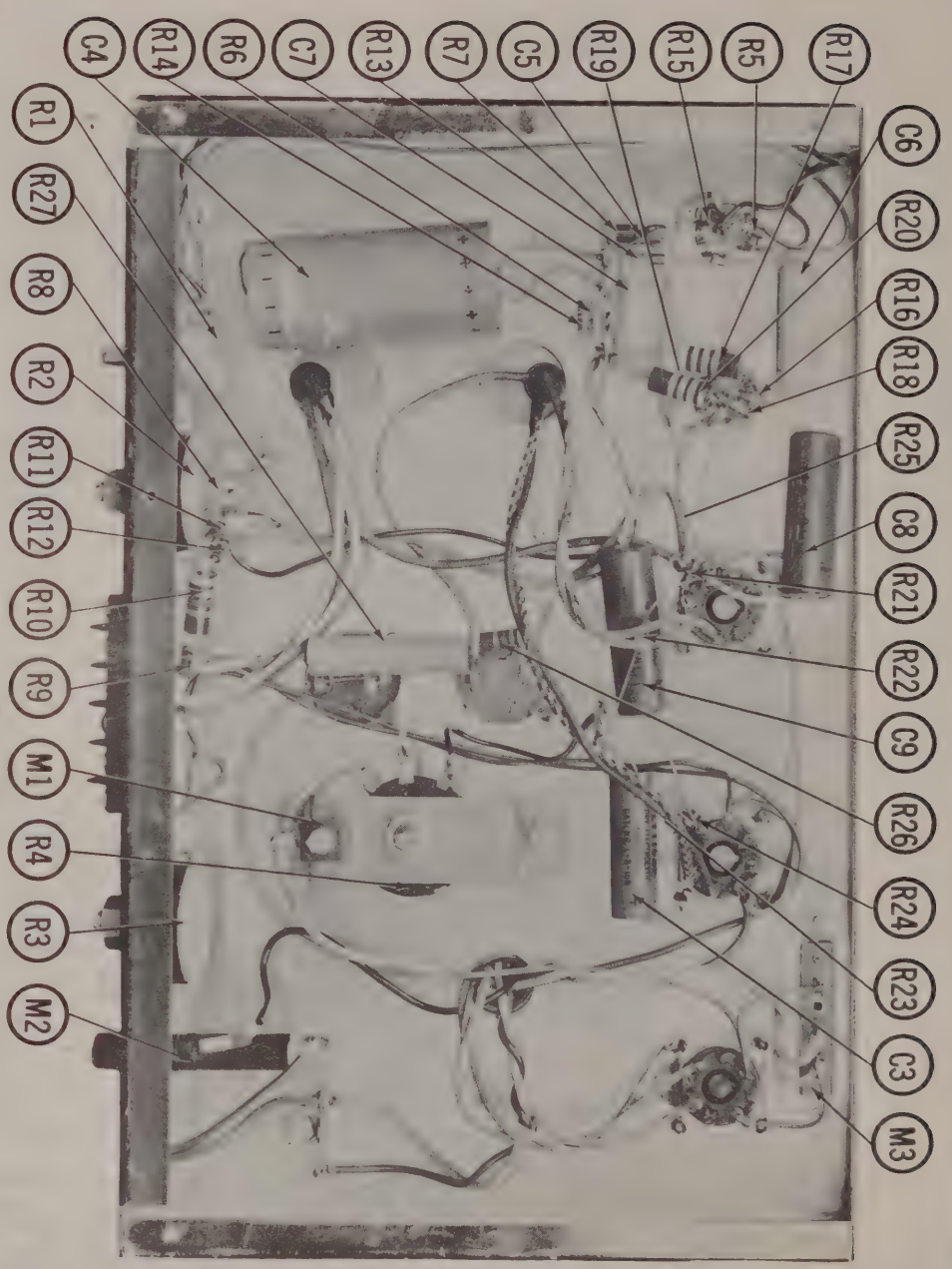
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PEDERSEN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	2A 250V	(Note 1)		312002. (3AG2A)	342001	AGC2	HKP

Note 1. Some versions may use a 3A fuse.

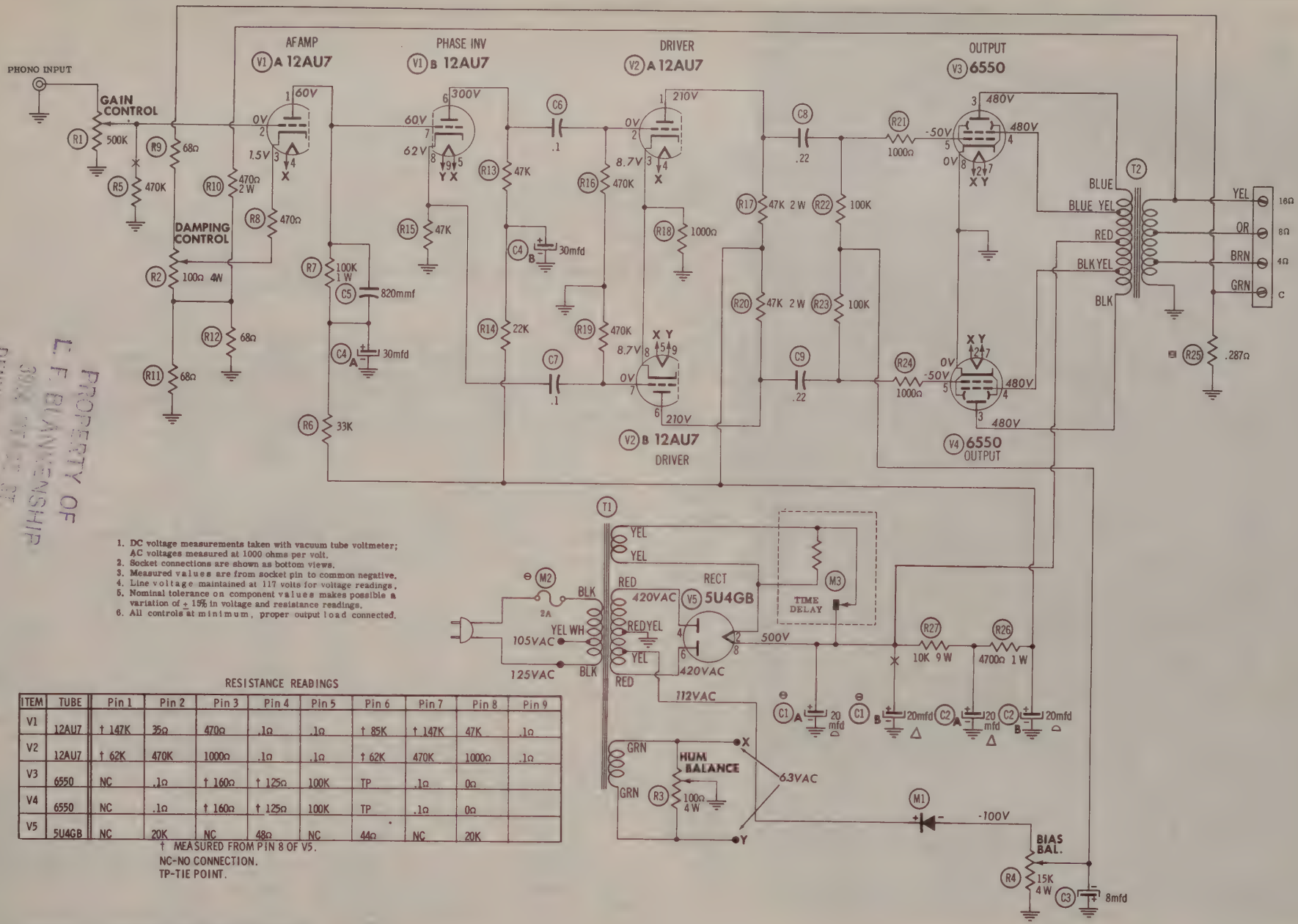
MISCELLANEOUS

ITEM No.	PART NAME	PEDERSEN PART No.	NOTES
M3	Switch		Time Delay

CHASSIS—BOTTOM VIEW



PEDERSEN Model W-50



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	† 147K	35Ω	470Ω	.1Ω	.1Ω	† 85K	† 147K	47K	.1Ω
V2	12AU7	† 62K	470K	1000Ω	.1Ω	.1Ω	† 62K	470K	1000Ω	.1Ω
V3	6550	NC	.1Ω	† 160Ω	† 125Ω	100K	TP	.1Ω	0Ω	
V4	6550	NC	.1Ω	† 160Ω	† 125Ω	100K	TP	.1Ω	0Ω	
V5	5U4GB	NC	20K	NC	48Ω	NC	44Ω	NC	20K	

† MEASURED FROM PIN 8 OF V5.
NC-NO CONNECTION.
TP-TIE POINT.

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OTTAWA, OHIO

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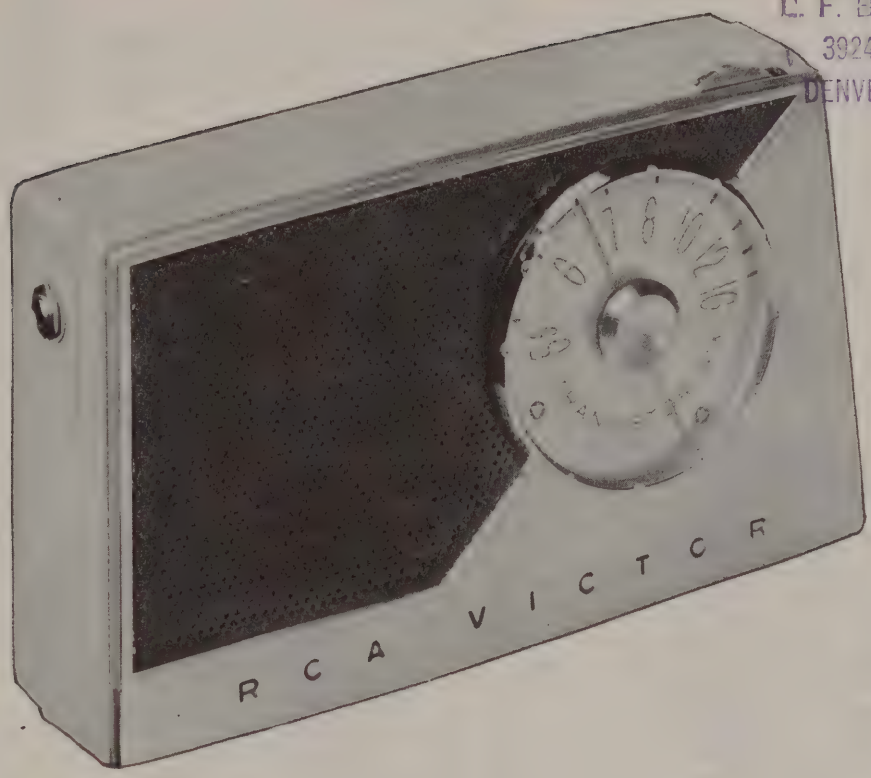
RCA VICTOR MODEL
7-BT-9J (Ch. RC-1159)



RCA VICTOR MODEL
7-BT-9J (Ch. RC-1159)

TRADE NAME	RCA Victor Model 7-BT-9J (Ch. RC-1159)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 2, N. J.
TYPE SET	Battery Operated Portable Transistor AM Superheterodyne Receiver
POWER SUPPLY	9 Volt "A" Battery
RATING	6.6MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to high side of antenna. Low side to B-.	455KC (400% Mod.)	Point of non-interference	Across Voice Coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1400KC	Tune to 1400KC signal	"	A4	Adjust for maximum output while rocking gang.
3.		"	600KC	Tune to 600KC signal	"	A5	"

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G443

PARTS LIST AND DESCRIPTIONS

RCA VICTOR
Model 7-BT-9J (Ch. RC-1159)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	2N35	
X2	1st IF Amplifier	2N34	
X3	2nd IF Amplifier	2N34	
X4	AF Amplifier	2N109	
X5	Output	2N109	
X6	Output	2N109	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	25	10	101614 (Note 1)	PWE10V25	EC25-10		ML-30-15		TE-1118
C2	25	10	101614	PWE10V25	EC25-10		ML-30-15		TE-1118
C3	10	10	101613	PWE10V10	EC10-10		ML-10-15		TE-1116
C4	25	10	101614	PWE10V25	EC25-10		ML-30-15		TE-1118

Note 1. Some versions use 45MFD in this application (Part No. 101793).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	50000		101611							
C6	100000		101610							
C7	.03	200	101698							
C8	100000		101610							
C9	100000		101610							
C10	100000		101610							
C11	100000		101610							
C12	100000		101610							
C13	100000		101610							
C14	50000		101611							
C15	.005	200	101742	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C16	.02	200	101612	BPD-02	DD-203	K085	817-02		5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	½	101616					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R2	470Ω		502147	BTS-470	
R3	390Ω		101607	BTR-390	
R4	1500Ω		502215	BTS-1500	
R5	22KΩ		502322	BTS-22K	
R6	3300Ω		502233	BTS-3300	
R7	560Ω		502156	BTS-560	
R8	15KΩ		502315	BTS-15K	
R9	2200Ω		502222	BTS-2200	
R10	470Ω		502147	BTS-470	
R11	560Ω		101743	BTR-560	
R12	4700Ω		502247	BTS-4700	
R13	39KΩ		502339	BTS-39K	
R14	4700Ω		502247	BTS-4700	
R15	1000Ω		101608	BTR-1000	
R16	100Ω		502110	BTS-100	
R17	12KΩ		502312	BTS-12K	
R18	150Ω Ⓐ 72°F, NTC				Note 1
R19	390Ω		30498	BTS-390	Note 2

Note 1. When R19 is used, C18 is a 270Ω Ⓐ 72°F NTC resistor (Part No. 101822).
Note 2. Not used in early production.

TRANSFORMER (AUDIO)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	505Ω	410ΩCT	101618				TR-3 ①		① Use original channel
	Turns Ratio								
	1.5 to 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1.5KΩ	14Ω	101619						

SPEAKER

ITEM No.	RATINGS				REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.		RCA Victor PART No.	QUAM PART No.	RCA TYPE No.	
SP1	2 3/4"	PM	14Ω		101634		222S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.1Ω	2.3Ω	101626				
L2	Osc. Coil	.4Ω	7Ω *	101622				* Tapped Ⓐ .5Ω
L3	1st IF Trans.	7.5Ω ■	.3ΩCT	101625				■ Tapped Ⓐ 2.3Ω
L4	2nd IF Trans.	7.5Ω ▲	.3ΩCT	101623				▲ Tapped Ⓐ 1.4Ω
L5	3rd IF Trans.	7.5Ω ▬	.6Ω	101624				▬ Tapped Ⓐ 1.1Ω

BATTERIES

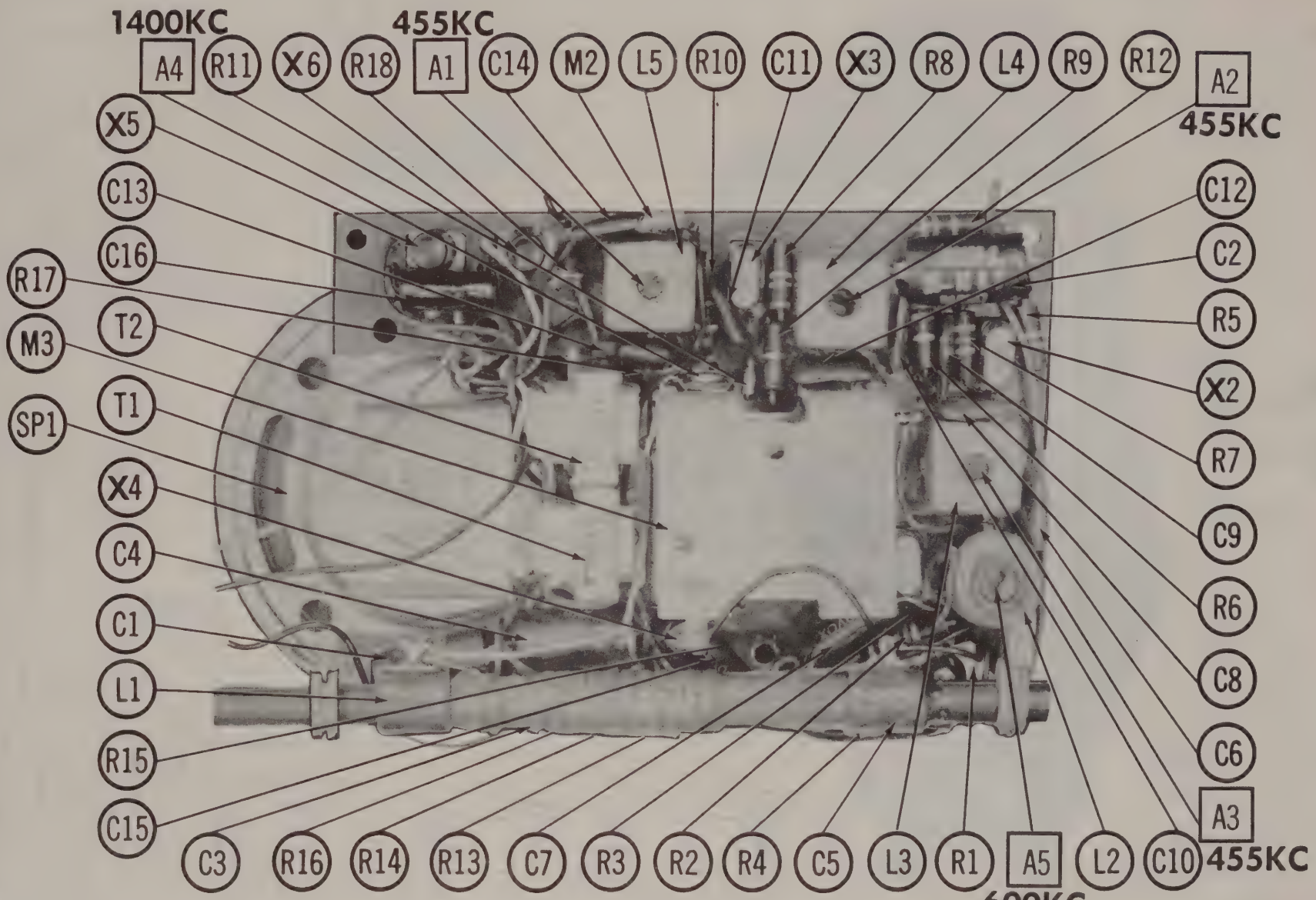
ITEM No.	VOLTAGE	RCA Victor PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	9V"A"	VS-300	226						

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		RCA Victor PART No.	SYLVANIA PART No.	
M2	1N295	101615	1N60	Audio Det. (Pigtail)

MISCELLANEOUS

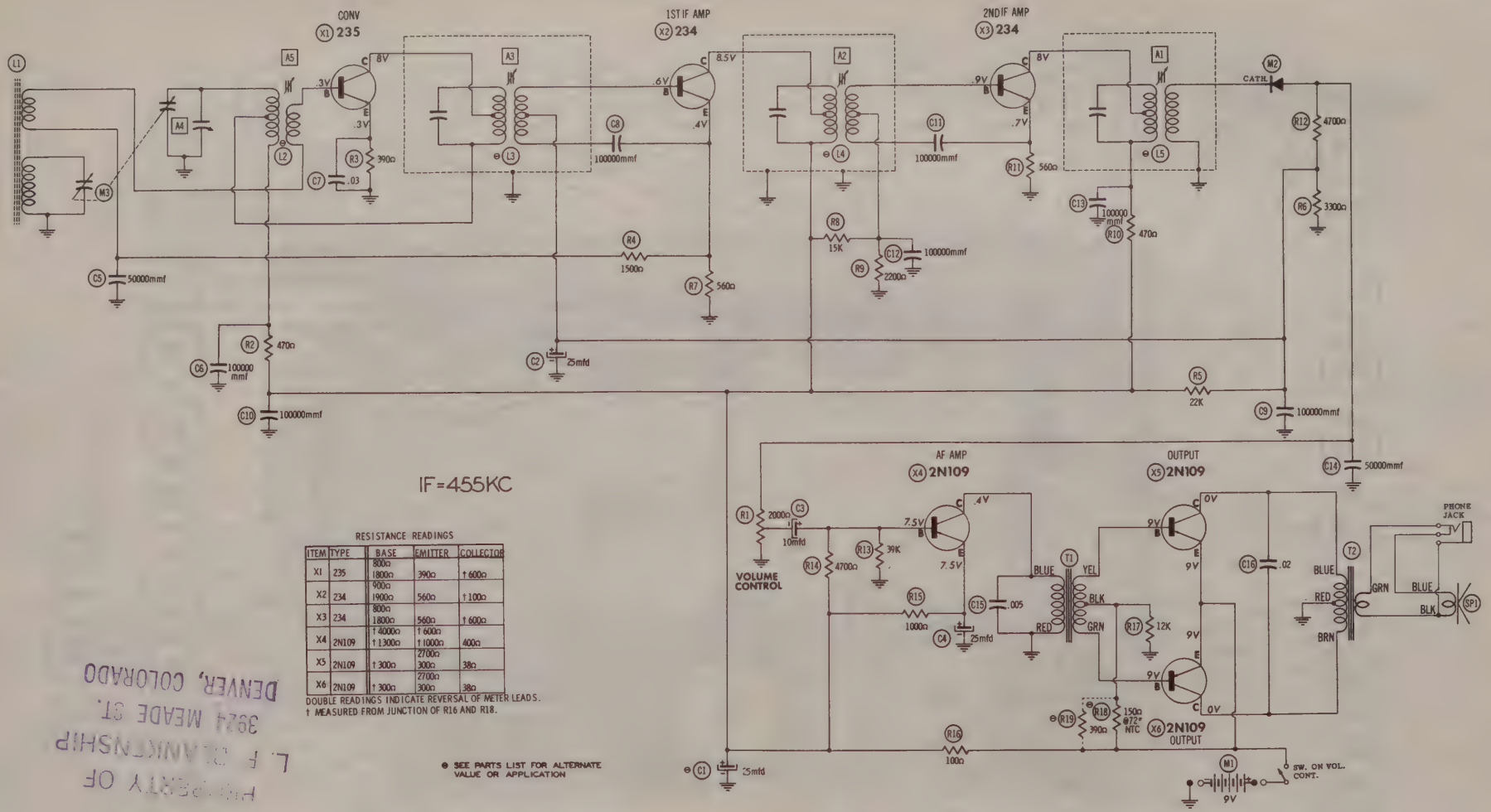
ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Tuning Cap.	101617	2 Gang (8-85MMF, 13-75MMF)
	Case	Y2882	Back
	Case	Y2881	Front
	Knob	101637	On-Off-Volume
	Knob	101635	Tuning
	Dial	101640	



CHASSIS TOP VIEW

RCA VICTOR
Model 7-BT-9J (Ch. RC-1159)

SET 327 FOLDER 10



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	235	800Ω 1800Ω	390Ω	†600Ω
X2	234	900Ω 1900Ω	560Ω	†100Ω
X3	234	800Ω 1800Ω	560Ω	†600Ω
X4	2N109	†4000Ω †1300Ω	†600Ω †1000Ω	400Ω
X5	2N109	†300Ω	2700Ω 300Ω	38Ω
X6	2N109	†300Ω	2700Ω 300Ω	38Ω

DOUBLE READINGS INDICATE REVERSAL OF METER LEADS.
† MEASURED FROM JUNCTION OF R16 AND R18.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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RAULAND
MODEL 1520

RAULAND
MODEL 1520

TRADE NAME	Rauland Model 1520
MANUFACTURER	Rauland-Borg Corp., 3515 W. Addison St., Chicago 18, Ill.
TYPE SET	AC Operated Audio Amplifier
TUBES (Six)	Types 12AX7 Preamplifier, 12AX7 AF Amplifier, 12AX7 AF Amplifier-Phase Inverter, (2) 5881 Output, 5U4GB Rectifier
POWER SUPPLY	117 Volts AC-60 Cycles (or) 130 Volts AC-60 Cycles
RATING	.97 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp. -Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V4	Output	5881	
V5	Output	5881	
V6	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	30	500	CE-306B-B	E3A392		FP175			R1152 *
C2A	▲ 40	450	CE-706A-C	AFH4-17	D016	FP475. 5	TMQ-17	Q-055	TVL-4840
B	10	450							
C	▲ 10	450							
D	■ 10	450							
C3	8	450	CE-805B-D	PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C4	35	50	CE-406K-A	PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308
C5	35	50	CE-406K-A	PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

* Unit must be ordered from manufacturer.

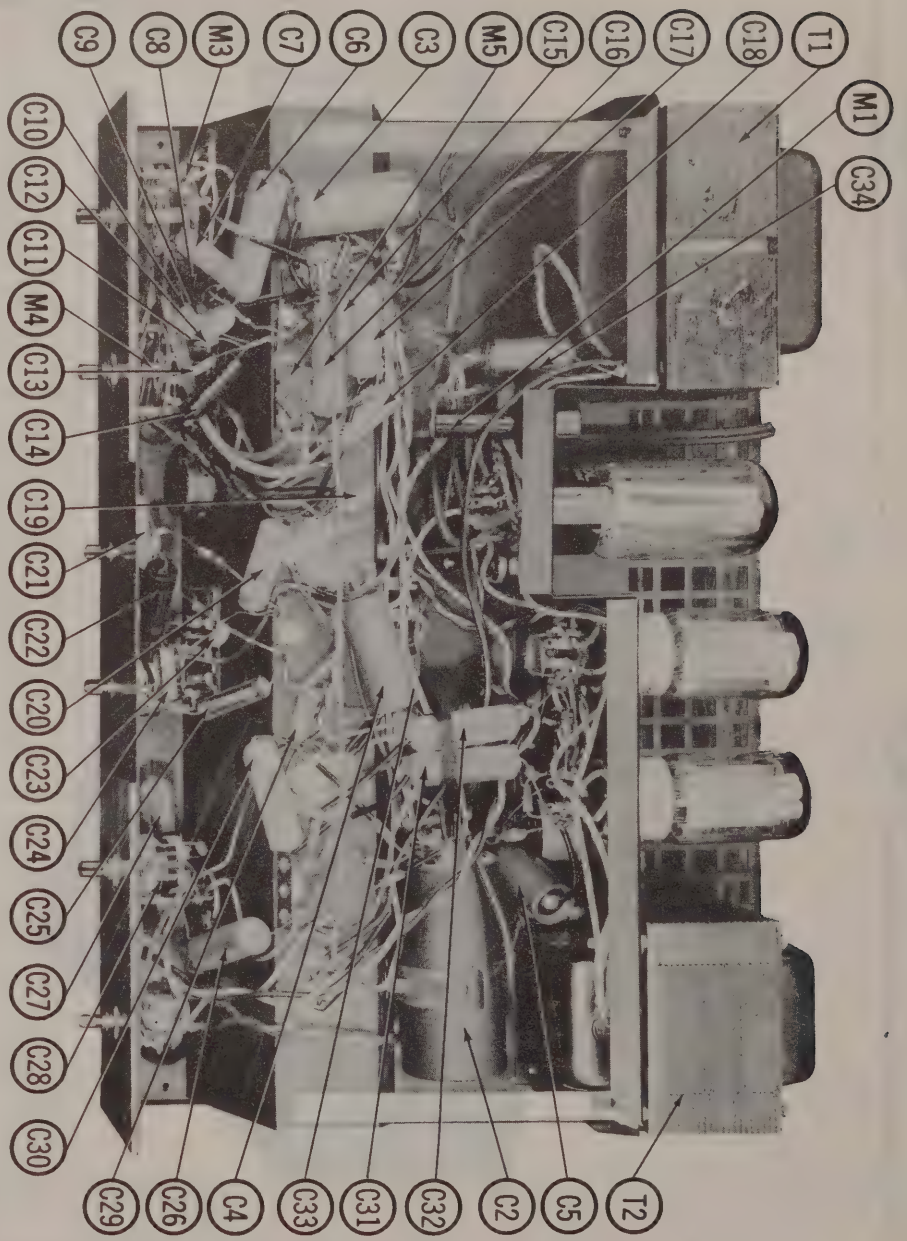
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C7	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C8	.0068	600		SI6800	D6-682	CUB6D68	811-0068		6TM-D68	
C9	4700			DI-0047	DD-502	K079	GP2-333-472	UC-5247	5GA-D47	
C10	2200			DI-0022	D6-222	TP57	GP2-333-222	UC-5222	5GA-D22	
C11	270			DI-00027	D6-271	TP41	811-271	UC-5327	5GA-T27	
C12	560			DI-00056	D6-561	TP48	GP2K-561	UC-5356	5GA-T56	
C13	1000			DI-001	D6-102	TP52	811-102	UC-521	5GA-D1	
C14	.0068	600		SI6800	D6-682	CUB6D68	811-0068		6TM-D68	
C15	47	500		SI47	D6-470	5W5Q47	GP1K-470	MC225	1FM-447	Note 1
C16	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C17	.022	600		BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C18	.022	600		BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C19	1500			DI-0015	D6-152	G071	811-152	UC-5215	5GA-D15	
C20	.022	600		BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C21	.0056	600		SI5600	D6-562	TP65	GP3-333-562			
C22	.056	600								
C23	330			SI330	D6-331	G056	811-331	UC-5333	5GA-T33	
C24	15	500		SI15	D6-150	5W5Q15	GP1K-150		1FM-415	
C25	.0033	600		SI3300	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C26	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C27	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C28A	200									
B	100									
C	4500			♦PA444						
D	4500									
C29	47	500		SI47	D6-470	5W5Q47	GP1K-470	MC235	1FM-447	
C30	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C31	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C31	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C32	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C33	470	500		SI470	D6-471	5W5T47	GP2K-471	UC-5347	1FM-347	
C34	.02	600		P689X-02		TMJ6S24P		OT-103	PX-126	

Note 1. Not used in some versions.
♦ Items C28A, C28B, C28C, C28D, R35A, and R35B are combined in one unit and are part of R2.

CHASSIS-CAPACITOR IDENT.



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RAULAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	
R1A	500KΩ	1	RP-504W-D	B-60-S	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	Not Req.	SWE-12	76-1	UB-96	Attach to R1A.
R2	500KΩ	1	RP-504AG	C1-60-S				Contour & Switch-tapped @ 100KΩ & 200KΩ
R3A	500KΩ	1	RP-504AK-D	B-60	A47-500K-Z	Q13-133	U-48	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A.
R4A	500KΩ	1	RP-504AK-D	B-60	A47-500K-Z	Q13-133	U-48	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R4A.
R5A	500KΩ	1	RP-504AK-D	B-60	A47-500K-Z	Q13-133	U-48	Tuner Level
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R5A.
R6	200Ω	1	RPW-201F					Mag. Hum Balance-Wire Wound
R7	200Ω	1	RPW-201F					Amp. Hum Balance-Wire Wound
R8	500Ω	1	RP-501D					Damping & Switch
R9A	100Ω	2	RPW-101B-A	WPK-100	A43-100		R100L	Bias-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1		Not Req.	Attach to R9A.
R10A	100Ω	2	RPW-101B-A	WPK-100	A43-100		R100L	Balance-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1		Not Req.	Attach to R10A.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R11	470KΩ			BTS-470K	
R12	27KΩ			BTS-27K	
R13	22KΩ			BTS-22K	
R14	100KΩ			BTS-100K	
R15	150KΩ			BTS-150K	
R16	220KΩ 1%			DCC-220K	
R17	10KΩ			BTS-10K	
R18	1500Ω 1%			DCC-1500	
R19	470KΩ			BTS-470K	
R20	47KΩ 1%			DCC-47K	
R21	1500Ω 1%			DCC-1500	
R22	68KΩ			BTS-68K	
R23	100KΩ			BTS-100K	
R24	47KΩ			BTS-47K	
R25	1.5MEG			BTS-1.5MEG	
R26	3.3MEG			BTS-3.3MEG	
R27	33KΩ			BTS-33K	
R28	6800Ω			BTS-6800	
R29	47KΩ			BTS-47K	
R30	4700Ω			BTS-4700	
R31	47KΩ			BTS-47K	
R32	220Ω			BTS-220	

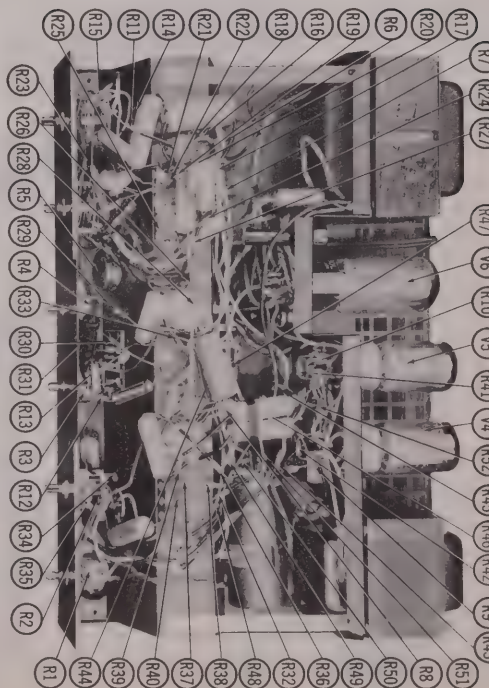
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R33	1500Ω			BTS-1500	
R34	470KΩ			BTS-470K	
R35A	50KΩ			BTS-47K	
B	50KΩ			BTS-47K	
R36	270KΩ			BTS-270K	
R37	470KΩ			BTS-470K	
R38	47KΩ			BTS-47K	
R39	68KΩ			BTS-68K	
R40	47KΩ			BTS-47K	
R41	470KΩ			BTS-470K	
R42	470KΩ			BTS-470K	
R43	300Ω	10		PW10-300	
R44	3000Ω 5%			BTS-3000 5%	
R45	6Ω	10			
R46	180Ω 5%	1		BTA-180 5%	
R47	300Ω 5%	1		BTA-300	
R48	10KΩ			BTS-10K	
R49	10KΩ			BTS-10K	
R50	10KΩ			BTS-10K	
R51	10KΩ			BTS-10K	
R52	4.7Ω			BW½-4.7	

* Items R35A, R35B, C28A, C28B, C28C, C28D are combined in one unit and are part of R2.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	RAULAND PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	130VAC Tap @ 117VAC @ .97A	800VCT @ .109A	5VAC @ 3A	6.8VAC @ 2.65A SEC.4 10.4VAC @ .17A	LP-0247-B					

CHASSIS - RESISTOR IDENT.



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RAULAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	
T2	6.7KΩ	16Ω Tap @ 8Ω	LO-0142						

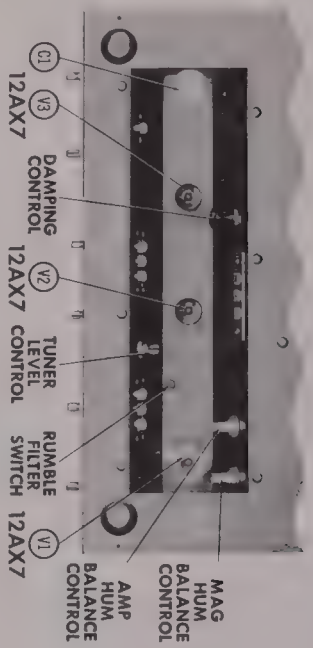
FUSES

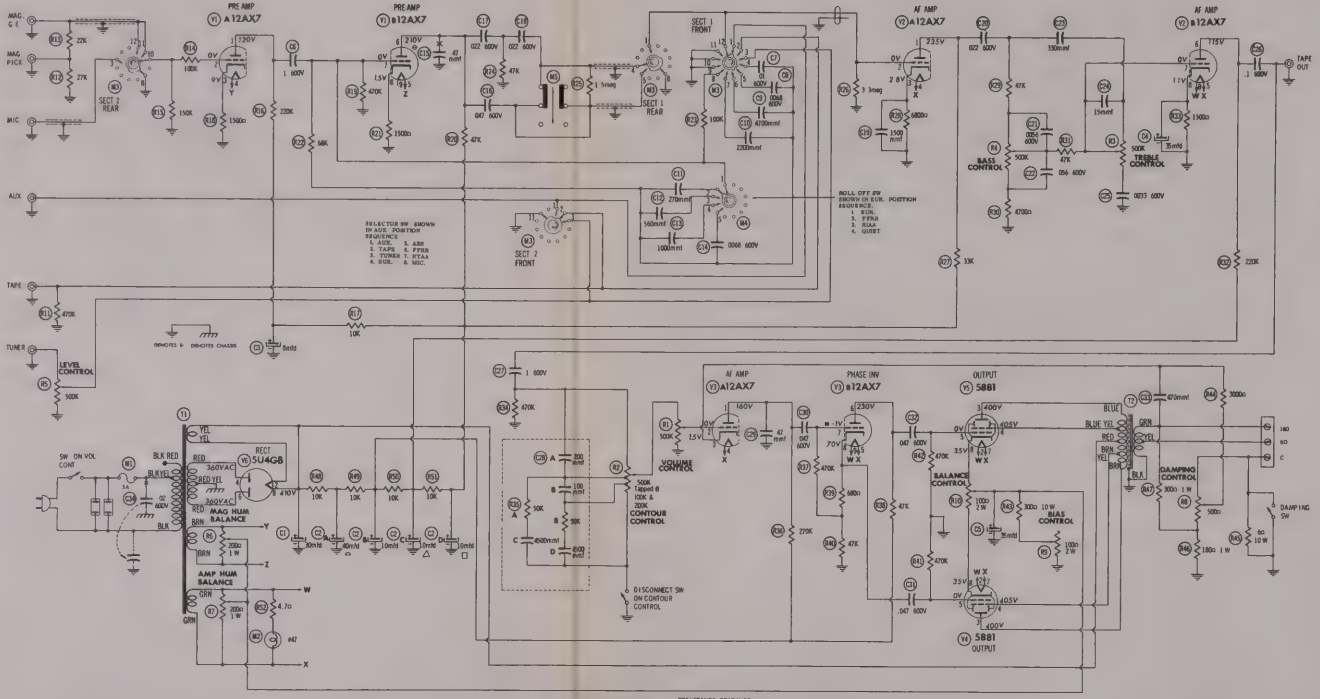
ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			RAULAND PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	3A 250V			312003. (3AG 3H)	341001	AGC3	HKP	

MISCELLANEOUS

ITEM No.	PART NAME	RAULAND PART No.	NOTES
M2	Pilot Light		#47
M3	Switch	X-0318	Selector (Rotary, Wafer Type)
M4	Switch	X-0319	Roll Off (SP-4 Position Rotary Wafer Type)
M5	Switch	X-0246D	Rumble Filter (DPDT-Slide Type)

CABINET - BOTTOM VIEW





DENOTES ⏚ DENOTES CHASSIS

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑ 270K	250K	1.5K	400Ω	400Ω	↑ 87K	470K	1.5K	400Ω
V2	12AX7	↑ 70K	560K	6.8K	400Ω	400Ω	↑ 250K	50K	1.5K	400Ω
V3	12AX7	↑ 290K	0Ω	3K	400Ω	400Ω	↑ 67K	120K	47K	400Ω
V4	5881	TP	400Ω	↑ 130Ω	↑ 95Ω	470K	TP	400Ω	400Ω	
V5	5881	TP	400Ω	↑ 130Ω	↑ 95Ω	470K	TP	400Ω	400Ω	
V6	5U4GB	NC	400K	TP	88Ω	TP	85Ω	TP	500K	

ALL MEASUREMENTS TAKEN WITH SELECTOR SWITCH IN AUX POSITION AND ROLL-OFF SWITCH IN EXTREME COUNTER CLOCKWISE POSITION

↑ MEASURED FROM PIN 8 OF V6
#MEASURED FROM PIN 8 OF V3
NC-NO CONNECTION.
TP-TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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RAYTHEON MODELS C-214-B, -M, C-216-B, -M, C-218, M-210-B, -M, UC-213-B, -M, UC-215-B, -M, UC-217-B, -M, UC-219, UM-211-B, -M (Ch. 21T40, 21T41, 21T43, 21T44, 21T45, 21T46)

RAYTHEON MODEL UM-211-M

TRADE NAME	Raytheon	MODELS	CHASSIS
		C-214-B, C-214-M, M-210-B, M-210-M	21T40
		UC-213-B, UC-213-M, UC-215-B, UC-215-M, UM-211-B, UM-211-M	21T41
		C-218	21T43
		UC-219	21T44
		C-216-B, C-216-M	21T45
		UC-217-B, UC-217-M	21T46

MANUFACTURER	Raytheon Manufacturing Co., Television & Radio Div., 5921 W. Dickens Ave., Chicago 39, Illinois
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	105-115 Volts AC-60 Cycle RATING 1.72 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 46.75MC, Sound IF 42.25MC (Intercarrier)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 9 push-on type control knobs from front panel of cabinet.

2. Remove 2 metal screws located behind the picture and channel selector knobs.

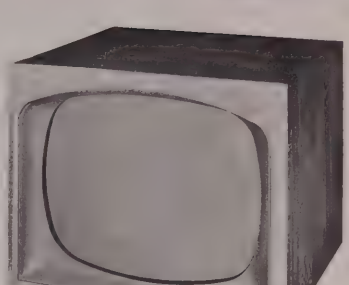
3. Remove 9 metal screws. Remove rear cover.

4. Remove 2 metal screws holding AC interlock-antenna terminal bracket.

5. Remove picture tube socket, HV lead, ion trap and speaker leads.

6. Remove 4 chassis bolts. Lift chassis from cabinet.

7. Remove 2 speaker bolts. Remove speaker.



MODEL UM-211-M

RAYTHEON MODELS C-214-B, -M, C-216-B, -M, C-218, M-210-B, -M, UC-213-B, -M, UC-215-B, -M, UC-217-B, -M, UC-219, UM-211-B, -M (Ch. 21T40, 21T41, 21T43, 21T44, 21T45, 21T46)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet just below the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws holding name plate at the bottom edge of the safety glass. Remove name plate and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Adjustment is located on tube side of the chassis. Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control (R9) located on the tube side of the chassis for maximum sound and MINIMUM buzz.

HORIZONTAL SIZE CONTROL

The horizontal size control is a brass sleeve located on the neck of the picture tube and slides between the yoke and the picture tube. Push sleeve into yoke to decrease size and pull out to increase size.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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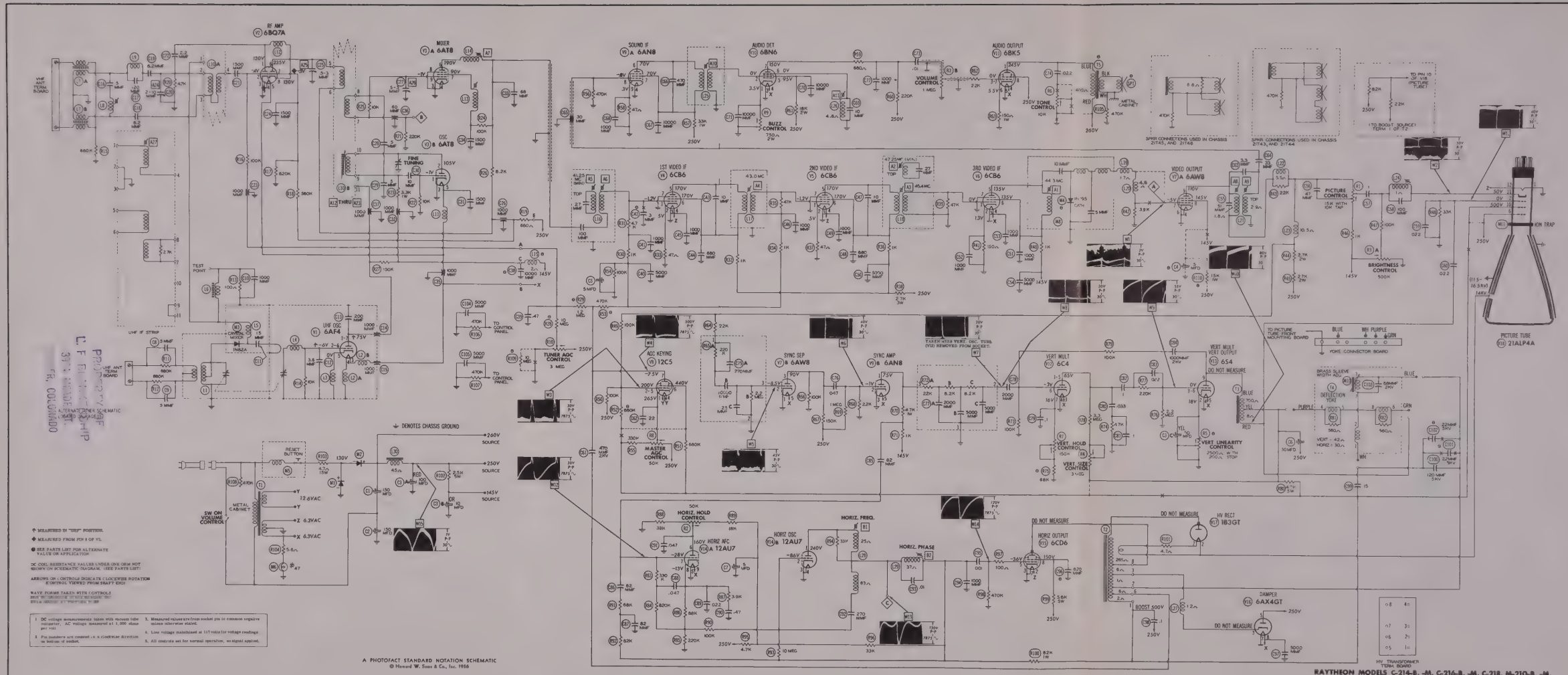

◆ MEASURED IN "SET" POSITION.

◆ MEASURED FROM PIN 8 OF V2.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS [illegible]

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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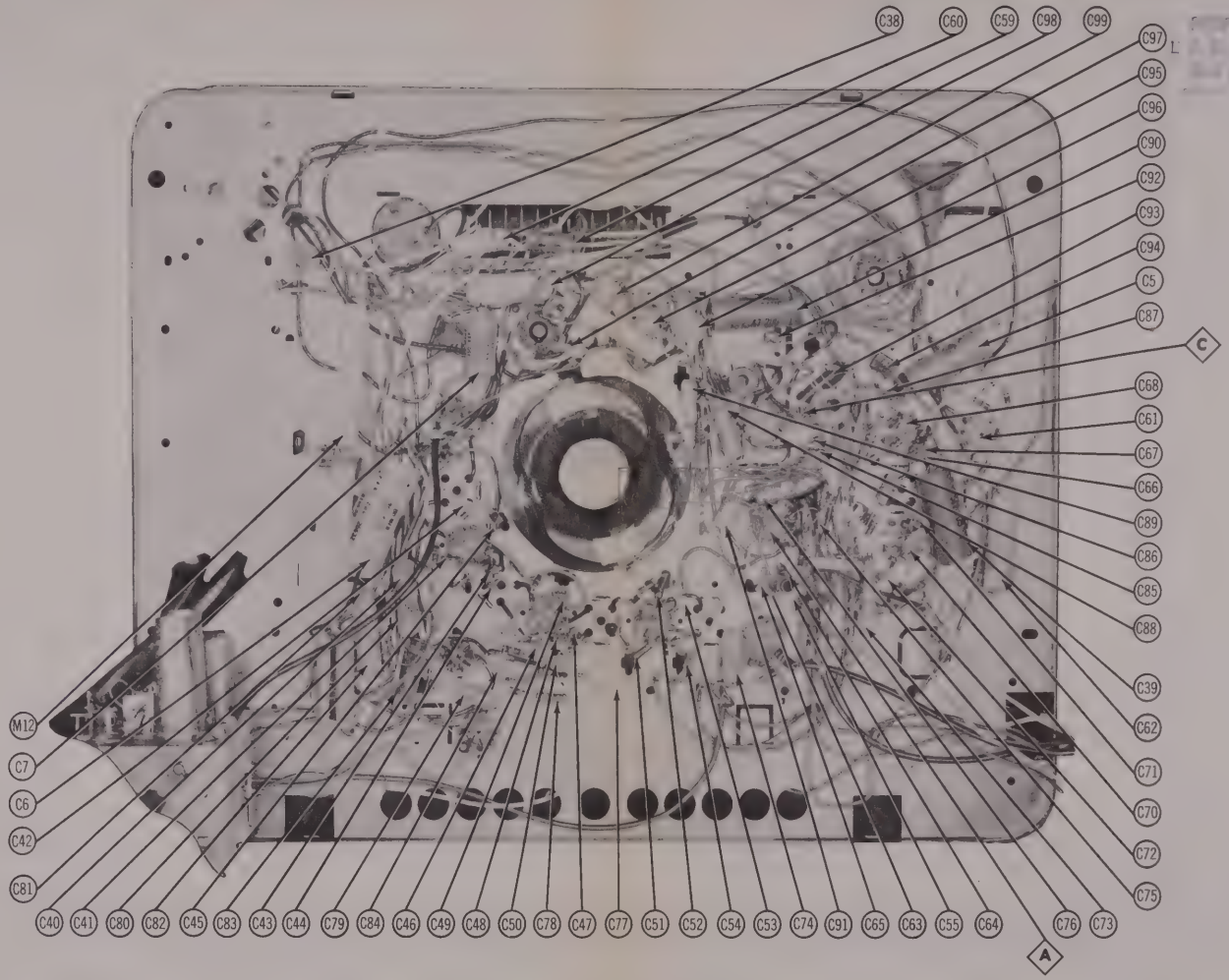
RAYTHEON MODELS C-214-B, -M, C-216-B, -M, C-218, M-210-B, -M, UC-213-B, -M, UC-215-B, -M, UC-217-B, -M, UC-219, UM-211-B, -M (Ch. 21T40, 21T41, 21T43, 21T44, 21T45, 21T46)

RAYTHEON MODELS C-214-B, -M, C-216-B, -M, C-218, M-210-B, -M, UC-213-B, -M, UC-215-B, -M, UC-217-B, -M, UC-219, UM-211-B, -M (Ch. 21T40, 21T41, 21T43, 21T44, 21T45, 21T46)



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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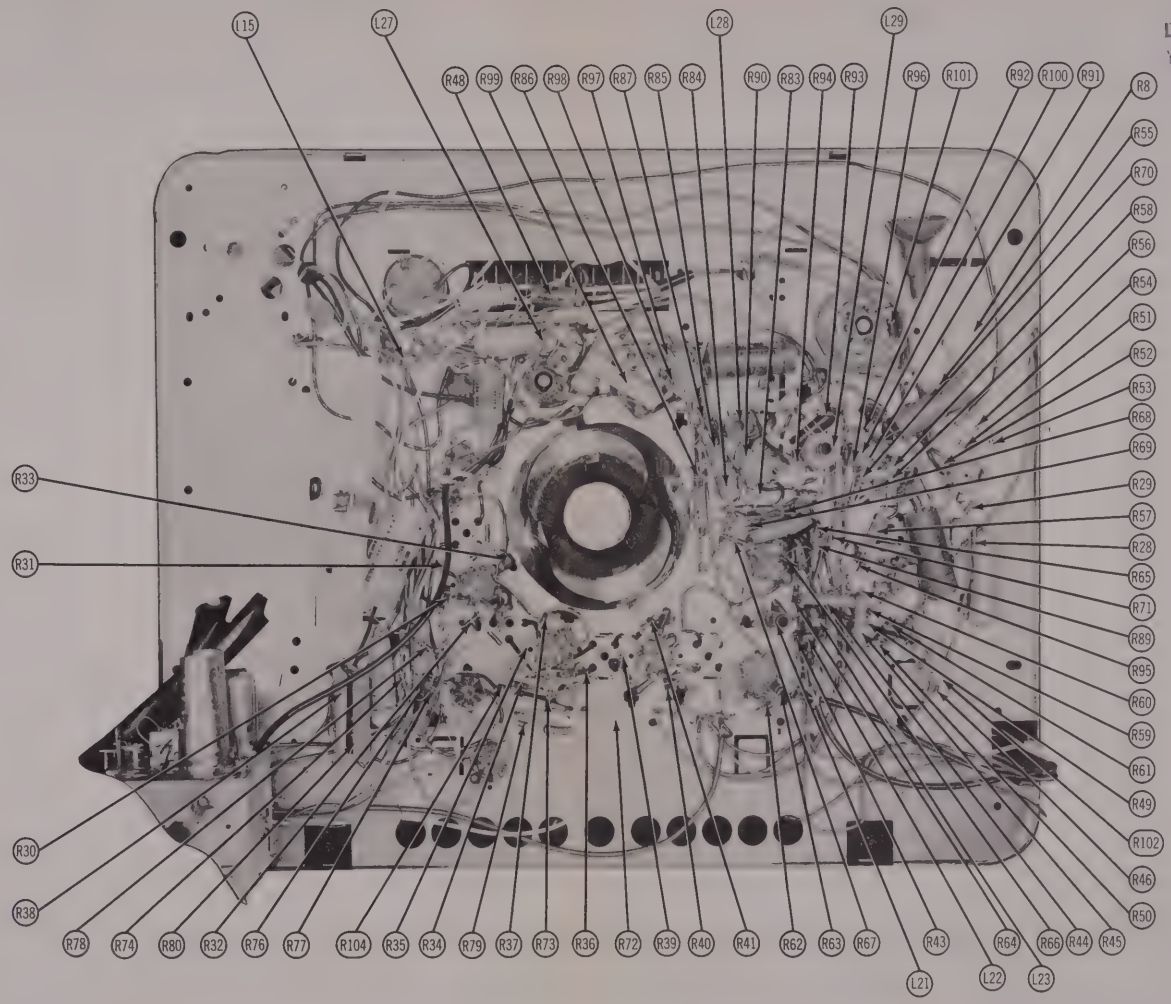

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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TUBE PLACEMENT CHART

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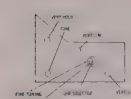
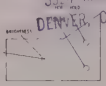
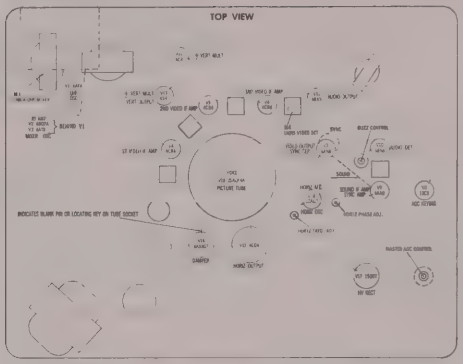
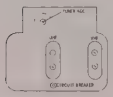








TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2), Circuit Breaker (M5)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V8, V18**
Has pic, no sound - **V9, V10, V11**
Overloaded picture - **V8**

SYNC FAILURE
No vert. sync - **V8, V12, V13**
No horiz. sync - **V9, V14**
No vert. or horiz. sync - **V7, V9**

SWEEP FAILURE
No raster, has sound - **V14, V15, V16, V17, V18**
No vertical deflection - **V13, V13**
Poor vert. linearity or foldover - **V13, V13**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V17, M1, M3**
Vert. off freq. - **V8, V12, V13**
Horiz. off freq. - **V9, V14**

RAYTHEON MODELS C-214-B, -M, C-216-B, -M, C-218, M-210-B, -M, UC-213-B, -M, UC-215-B, -M, UC-217-B, -M, UC-219, UM-211-B, -M (Ch. 21740, 21741, 21743, 21744, 21745, 21746)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from the chassis.

VIDEO IF ALIGNMENT

Connect a .001MFD capacitor across the vertical input terminals of the oscilloscope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	Not used	44. 3MC (Unmod.)	10	Use VTVM. DC probe to point (A). Common to chassis.	A1	Attenuate signal generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
2.	"	"	"	47. 25MC	"	"	A3	Adjust for MINIMUM deflection.
3.	"	"	"	45. 4MC	"	"	A3	Adjust for maximum deflection. Repeat step 2.
4.	"	"	"	43. 0MC	"	"	A4	"
5.	"	"	43. 5MC (10MC Swp.)	42. 5MC 45. 7MC	"	Vert. amp. thru 10KΩ to point (A). Low side to chassis.		Use only enough sweep generator output for useable pattern on scope. Check for response curve similar to Fig. 1. If necessary, retouch A1, A3, A4 for desired response. Adjust A1 for MINIMUM tilt. A3 affects the high frequency (45. 6MC) side of response curve. A4 affects the low frequency side (42. 5MC).
7.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	Not used	41. 25MC (Unmod.)	"	Use VTVM. DC probe to point (A). Common to chassis.	A5	Adjust for MINIMUM deflection.
7.	"	"	43. 5MC (10MC Swp.)	42. 5MC 45. 6MC		Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A6, A7	Adjust A6 and A7 for response similar to Fig. 2. If necessary, SLIGHTLY retouch A1 for MINIMUM tilt. A3 for position of 45.6MC marker and A4 for position of 42. 5MC marker.

SOUND IF ALIGNMENT

Restore the receiver to normal operating condition. Tune in a TV station and adjust the fine tuning control until sound bars just appear in the picture. Adjust A8 fully counter clockwise from coil turns. Then clockwise until the scanning lines are smooth and continuous. Readjust the fine tuning for clearest picture and best sound. Insert an attenuator in series with the antenna and the receiver antenna terminals so that the signal strength may be varied from weak to strong. If a suitable attenuator is not available stray feed the signal to the receiver by placing the antenna lead-in near the antenna terminals. Reduce the signal input to the receiver so that the signal falls below the limiting level of the 6BN6 as evidenced by a bias in the sound. Adjust the secondary of the sound take-off transformer A9, the sound IF transformer A10, the quadrature coil A11 and the buzz control R9 for maximum sound and MINIMUM buzz. If the bias disappears during adjustments, increase attenuation until bias reappears.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 1. 5 volt battery to the tuner AGC. Connect the positive lead to chassis. The channel oscillator adjustments screws are reached through a hole just below the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors each lead.	Across VHF antenna terminals with 120Ω in	213MC (10MC Swp.)	211. 25MC 215. 75MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should be at 50%.
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12		A13	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A14	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A15	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A16	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A17	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A18	
			83MC (10MC Swp.)	83. 25MC 87. 75MC	6		A19	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A20	
			62MC (10MC Swp.)	67. 25MC 71. 75MC	4		A21	
			83MC (10MC Swp.)	61. 25MC 65. 75MC	3		A22	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A23	

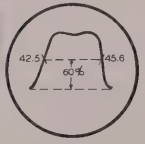


FIG. 1

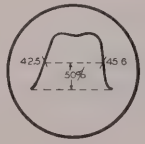


FIG. 2

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Connect the bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	195MC (10MC Swp.)	193.25MC 197.75MC	10	Vert. amp. thru 10KΩ to point Ⓖ. Low side to chassis.	A24, A25, A26	Adjust for response curve similar to Fig. 4 with markers above 90%.
10.	"	"	213MC (10MC Swp.)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel, make compromise adjustment of A24, A25 and A26 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp.)	205.25MC 209.75MC	12			
			201MC (10MC Swp.)	199.25MC 203.75MC	11			
			189MC (10MC Swp.)	187.25MC 191.75MC	9			
			183MC (10MC Swp.)	181.25MC 185.75MC	8			
			177MC (10MC Swp.)	175.25MC 179.75MC	7			
			85MC (10MC Swp.)	83.25MC 87.75MC	6			
			79MC (10MC Swp.)	77.25MC 81.75MC	5			
			69MC (10MC Swp.)	67.25MC 71.75MC	4			
			63MC (10MC Swp.)	61.25MC 65.75MC	3			
			57MC (10MC Swp.)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	600MC (10MC Swp.)		35	Vert. amp. thru 10KΩ to point Ⓖ. Low side to chassis.	A27	Attenuate generator output to maintain only enough signal to obtain desired response. Adjust A27 for response similar to Fig. 5.
12.	"	"	470MC (10MC Swp.)		14	"		Response curve should have tilt similar to Fig. 6.
13.	"	"	870MC (10MC Swp.)		80	"		Response curve tilt should be similar to Fig. 7. Tilts on response curves in step 12 and 13 should be approximately equal. If not retouch A27 until they are.

FIG. 4

FIG. 5

FIG. 6

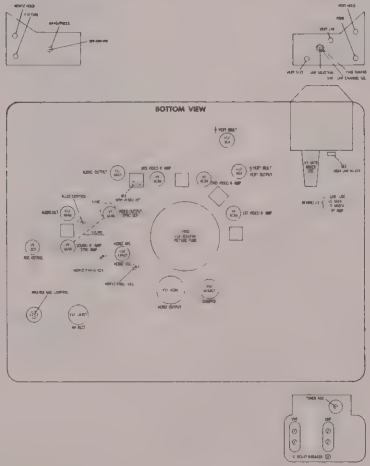
FIG. 7

RAYTHEON MODELS C-214-8, -M, C-216-8, -M, C-216, M-210-8, -M, UC-213-8, -M, UC-213-8, -M, UC-217-8, -M, UC-219, UM-211-8, -M (Ch. 21T40, 21T41, 21T43, 21T44, 21T45, 21T46)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4	¶ 5.8KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	¶ 5.8KΩ		
V2	6BQ7A	INF	1.5Meg	0Ω	0Ω	.1Ω	† 700Ω	300KΩ	INF	0Ω
V3	6AT8	10KΩ	† 5.8KΩ	0Ω	0Ω	.1Ω	† 8.2KΩ	† 100KΩ	0Ω	220KΩ
V4	6CB6	100KΩ	47Ω	0Ω	.1Ω	† 3.7KΩ	† 3.7KΩ	0Ω		
V5	6CB6	100KΩ	47Ω	0Ω	.1Ω	† 3.7KΩ	† 3.7KΩ	0Ω		
V6	6CB6	.1Ω	150Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V7	6AW8	0Ω	2.2Meg	† 60KΩ	0Ω	.1Ω	0Ω	3.9KΩ	† 2.5KΩ	† 4KΩ
V8	12C5	† 20KΩ	† 40KΩ	INF	INF	† 40KΩ	¶ 680KΩ	500KΩ		
V9	6AN8	† 8.2KΩ	22KΩ	0Ω	0Ω	.1Ω	† 33KΩ	† 33KΩ	470KΩ	47Ω
V10	6BN6	350Ω	.3Ω	0Ω	.1Ω	† 18KΩ	4.8Ω	† 220KΩ		
V11	6BK5	† 400Ω	NC	500KΩ	.1Ω	0Ω	150Ω	500KΩ	† 45Ω	TP
V12	6C4	¶ 4Meg	NC	.1Ω	0Ω	¶ 4Meg	100KΩ	140KΩ		
V13	6S4	NC	900Ω	2.2Meg	0Ω	.1Ω	2.2Meg	NC	NC	¶ 5.4KΩ
V14	12AU7	† 30KΩ	300KΩ	0Ω	0Ω	0Ω	† 25KΩ	1.5Meg	280KΩ	.1Ω
V15	6CD6	TP	.1Ω	0Ω	TP	470KΩ	TP	0Ω	† 5.6KΩ	TOP CAP ¶ 7.2Ω
V16	6AX4GT	TP	NC	70KΩ	NC	† 45Ω	TP	0Ω	.1Ω	
V17	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ¶ 272Ω
V18	21ALP4A	0Ω	33KΩ	PIN 6 † 45Ω	PIN 10 ¶ 10Ω	PIN 11 † 180Ω	PIN 12 .1Ω			

* MEASURED IN "UHF" POSITION
† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V16.
TP- TIE POINT
NC- NO CONNECTION.



TUBE PLACEMENT CHART

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DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4	
V2	RF Amplifier	6BQ7A	
V3	Mixer-Oscillator	6AT6	
V4	1st. Video IF Amplifier	6CB6	
V5	2nd. Video IF Amplifier	6CB6	
V6	3rd. Video IF Amplifier	6CB6	
V7	Video Output-Sync Sep.	6AW8	
V8	AGC Keying	12C8	
V9	Sound IF Amp.-Sync Amp.	5AN8	

ITEM No	USE	TYPE	NOTES
V10	Audio Detector	6BN6	
V11	Audio Output	6BK5	
V12	Vert. Mult.	6C4	
V13	Vert. Mult.-Vert. Output	6S4	
V14	Horiz.AFC-Horiz.Osc.	12AU7	
V15	Horiz. Output	6CD6	
V16	Damper	6AX4GT	
V17	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RAYTHEON PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V18	21ALP4A ①	21ALP4A ① 21ALP4B ①	21ALP4A ①		① Aluminised ② Silver screen "85"
			21ALP4A/B ①	21ALP4A/B ②	
		21ALP4	21ALP4		
	21ATP4 ①	21ATP4 ①	21ATP4 ①	21ATP4 ② 21ATP4A②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	RAYTHEON PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	150	150	8C-22464	AFHS1-70	XA004	FPU7	TM-150-150	T-050	TVL-1428
C2	150	150	8C-22463	AFHS1-70	XA004	FPU7	TM-150-150	T-050	TVL-1428
C3A	100	300	8C-28308	RE1043	D002	WQ835	TMT-176	T-537	TVL-3574
B	10	300			BR505			MT-0525	
C	80	80							
C4	5	300	8C-24174 (Note 1)	PR3350V4	BR435	TC80	TD-5-350	FM-3508	TVA-1801
C5	5	350	8C-20557	PR3350V4	BR435	TC80	TD-5-350	FM-3508	TVA-1801
C6	50	350	8C-25532	PR3350V50	BR5035	TC78	TD-50-450	FM-4540	TVA-1713
C7	5	300	8C-24174	PR3350V4	BR435	TC80	TD-5-350	FM-3508	TVA-1801

Note 1. Used in chassis 21T40, 21T43, 21T45 only.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RAYTHEON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	5		100S-24349							
C9	5		100S-24349							
C10	1000		107S-25748							
C11	15		107S-25749							
C12	3.6		107S-25750							
C13	300		107S-25751							
C14	1000		107S-25752							
C15	1000		107S-25752							
C16	5		107S-25740							
C17	130		107S-25741	DI-00012	DD-121	TS32	811-121		5GA-T12	
C18	8.2		107S-25739	NPO-SI8.2		ZO15	NP0A-8R2			
C19	8.2		107S-25739	NPO-SI8.2		ZO15	NP0A-8R2			
C20	3-10				S29-10					
C21	1500		107S-25753	BPD-0015	DD-152	KO71	801-0015	DC-5215	5HK-D15	
C22	3.3		107S-25744	NPO-SI3.3	TCZ-3R3	ZO06	NP0A-3R3		5TCCB-V33	
C23	1000									
C24	1500		107S-25753	BPD-0015	DD-152	KO71	801-0015	DC-5215	5HK-D15	
C25	5-3		105S-25323		S29-3		3139-01-0R5	CT065A		
C26	1000		107S-25743							
C27	.5-3		105S-25323		S29-3		3139-01-0R5	CT065A		
C28	5		107S-25744	NPO-SI5		ZO11	NP0A-050	ZT-556		
C29	5		100S-24349							
C30	10		107S-25746							
C31	1500		107S-25753	BPD-0015		KO71	801-0015	DD-5215	5HK-D15	
C32	1000		107S-25742						5TCU-Q68	
C33	68			N750-S68	TCN-68	N068	N750L-680			
C34	1500			BPD-0015	DD-152	KO71	801-0015	DD-5215	5HK-D15	
C35	1000		107S-25742							
C36	80									
C37	1000			BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	Note 2
C38	10000			P2S8N-47		CUSSP47		PT4047	2TM-P47	
C39	.47	200		BPD-005	DD-503	KO80	811-005	DC-525	5HK-D5	
C40	5000			BPD-001	DD-102	KO69	801-001	DC-521	5HK-D1	
C41	1000			NPO-D10		ZO07	NP0A-030	ZT-553		Note 3
C42	5			N750-SI10	TCN-10	TN01	N750A-100	NT-541	5TCU-Q1	
C43	10			SI680	D6-681	TP60	GP2K-681	UC-5368	5GA-T68	
C44	680			SI1000	D6-102	TP62	GP2L-102	UC-521	5GA-D1	
C45	1000			BPD-001	DD-102	KO69	801-001	DC-521	5HK-D1	
C46	1000			N750-SI10	TCN-10	TN01	N750A-100	NT-541	5TCU-Q1	
C47	10			SI680	D6-681	TP60	GP2K-681	UC-5368	5GA-T68	
C48	680			SI1000	D6-102	TP62	GP2L-102	UC-521	5GA-D1	
C49	1000			BPD-005	DD-503	KO80	811-005	DC-525	5HK-D5	
C50	5000			SI1000	D6-102	TP62	GP2L-102	UC-521	5GA-D1	
C51	1000			SI1000	D6-102	TP62	GP2L-102	UC-521	5GA-D1	
C52	1000			BPD-001	DD-102	KO69	801-001	DC-521	5HK-D1	
C53	1000			BPD-005	DD-503	KO80	811-005	DC-525	5HK-D5	
C54	5000									
C55	51									
C56	47			N330-SI47	TCA-47		N330L-470			
C57	.1	400		P4S8N-1	DF-104	CUB4P1		PT401	4TM-P1	
C58	100			NP0-D100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C59	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C60	.022	600		BPD-02	DF-303	CUB6S22	817-02	PT6122	6TM-S22	
C61	470	2000	SG-34999	HVD-30-470	DD30-471	V27A7	3KV-471	DC30347	20GA-T47	
C62	.22	400		P4S8N-23		CUB4P22		PT4023	4TM-P22	
C63	3.3			NP0-S13.3	TCZ-3R3	TZ06	NP0A-3R3	ZT-5533	5TCCB-V33	

RAYTHEON MODELS C-214-B, -M, C-216-B, -M, C-218, M-218-B, -M, UC-213-B, -M, UC-215-B, -M, UC-217-B, -M, UC-219, UM-211-B, -M (Ch. 21T40, 21T41, 21T43, 21T44, 21T45, 21T46)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	RAYTHEON PART No.	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	33			NPO-S133	TCZ-33	TZ1S	NPO1-330	ZT-S433	5TCC-Q33	
C55	30									
C56	470			1464-00047	DS-471	S1S747	S1J-471		MS-347	
C57	10000			BPD-01	DD-103	K082	S1J-01	DC-S21	5HK-81	
C58	1000			BPD-001	DD-102	K069	S01-001	DC-S21	5HK-D1	
C59	10			NPO-S110	TCZ-10	TZ09	NP0A-100	ZT-S41	5TCC-Q1	
C70	10000			BPD-01	DD-103	K082	S1J-01	DC-S21	5HK-81	
C71	10000			BPD-01	DD-103	K082	S1J-01	DC-S21	5HK-81	
C73	.001	400		BPD-001	DD-102	K069	S01-001	DC-S31	5HK-D1	
C73	.01	400		BPD-01	D6-103	CUD8S1	GP3-333-103	PT411	47TM-81	
C74	.022	600		BPD-03	DF-303	CUB6S22	S1T-S2	PT6122	67TM-S22	
C75A	270		‡PA-S433	‡PC-363	‡CC-S271	GP3K-S71	S1T-S27	DC-S537	90A-T27	
B	10000		‡PA-S33	‡PC-363	‡CC-S103	K082	S1J-01	DC-S11	5HK-81	
C	56					TP3A	S1T-S56	DC-S435	90A-Q56	
C76	.047	300		BPD-05	DF-S03	CUB3S47		PT4147	37M-S47	
C77A	3900		≠PA-110	≠PC-100	≠115TMD	≠1405-01		DC-S23	≠V-1	
B	10000							DC-S38		
C	5000							DC-S25		
C78	2000			S13D00	D6-203	TP3S	GP3-333-202	DC-S33	5HK-D2	
C79	.1	300		P3S8N-1	DF-104	CUS2P1		PT401	37M-P1	
C80	.033	400		BPD-03	DF-303	CUB8S33		PT4133	57M-S33	
C81	.1	300		P3S8N-1	DF-104	CUS2P1		PT401	37M-P1	
C83	.1	400		P4S8N-1	DF-104	CU34P1		PT401	47M-P1	
C83	.022	300		BPD-03	DF-S33	CUB4S22	S1T-S3	PT4133	37M-S33	
C84	1000	2000	8G-34901	BVD-30-1000	DD30-102	VZ1S	SKY-103	DC-S021	30GA-D1	
C85	82			1469-000083	TCZ-82	Z040	NPO-337-820		MS-482	
C86	82			1469-000083	TCZ-82	Z040	NPO-337-820		MS-482	
C87	82			1469-000083	TCZ-82	Z040	NPO-337-820		MS-482	
C88	.047	300		BPD-05	DF-S03	CUB3S47		PT4147	37M-S47	
C89	.033	300		BPD-03	DF-303	CUB4S33	S1T-S3	PT4133	37M-S33	
C90	.47	300		P3S8N-47		CUS2P47		PT3047	37M-P47	
C91	.047	600		BPD-05	DF-S03	CUB4S47		PT4147	47M-S47	
C93	270			1469-00027	TCZ-270	T240	S1J-271		MS-327	
C93	.01	600								
C94	1000			1464-001		1N5D1	S1J-102	MC3255	MS-S1	
C96	.001	600		BPD-001	D6-103	CUB6D1	GP3L-102	PT631	67M-D1	
C96	680	500		B3S3N	D6-681	1N1T62	S1J-681		MS-368	Note 4
C97	6000			BPD-005	DD-502	K089	S1J-005	DC-S25	5HK-D5	
C98	.1	500		P3S8N-1	DF-104	CUB6P1		PT601	57M-P1	
C99	300	300		P3S8N-s5		CUB3P30		PT4130	37M-P30	
C100	120	5000	8Q-25325							
C101	22	5000		BVD-50-22		V5G22	6KY-220	DC90422	90GA-Q22	Note 3
C102	22	5000		BVD-50-22		V5G22	6KY-220	DC90422	90GA-Q22	Note 3
C103	68	3000		BVD-30-68	DD30-680	V3Q68	3KY-680	DC30668	30GA-Q68	
C104	5000			BPD-005	DD-502	K089	S1J-005	DC-S25	5HK-D5	
C105	5000			BPD-005	DD-502	K089	S1J-005	DC-S25	5HK-D5	

† Items C75A, C75B, C75C, R65A and R65B are combined in one unit.
≠ Items C77A, C77B, C77C, R72A, R72B and R72C are combined in one unit.
Note 2. Used in chassis 21T41, 21T44 and 21T46 only.
Note 3. Not used in some versions.
Note 4. Some versions may use a .047MFD unit in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RAYTHEON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	15KΩ	½	B10B-25472	ABT-154	RTV-577	Q13-15EX		Picture tapped at 10KΩ
B	5MegΩ	½	B1aB1	AK-4		Not Reg.		Attach to R1A.
R2A	50KΩ	½	B10B-25917	AB-21	A47-50K-S	Q11-123	U-35	Horiz. Hold
B	5MegΩ	½	Not Reg.	AK-4	ES5-3	Not Reg.	Not Reg.	Attach to R2A.
R3A	500KΩ	½	B10A-25804	F1-40		* Q2-4004	UF55L	Brightness (Panel)
B	1Meg	½		R3-53			UX18A	Volume (Rear)
C	Switch			KS-1			UX-26	Attach to R3B.
R4A	3Meg	½	B10B-25945	AB-24	A47-3Meg-S	Q11-140	U-39	Vert. Size
B	Shaft		Not Reg.	AK-4	ES5-3	Not Reg.	Not Reg.	Attach to R4A.
R5A	250KΩ	½	B10B-25919	≠AB-5	≠A47-250K-S	≠Q11-13	≠U-6	Vert. Linearity
	with 2000 stop							
B	Shaft		Not Reg.	AK-4	ES5-3	Not Reg.	Not Reg.	Attach to R5A.
R6A	10KΩ	½	B10B-25916	AB-16	A47-10K-S	Q11-118	U-30	Tone
B	Shaft		Not Reg.	AK-4	ES5-3	Not Reg.	Not Reg.	Attach oto R6A.
R7A	150KΩ	½	B10B-25920	AB-23	A47-150K-S	Q11-132	U-43	Vert. Hold
B	Shaft		Not Reg.	AK-4	ES5-3	Not Reg.	Not Reg.	Attach to R7A.
R8A	50KΩ	½	B10B-25894	AB-21	A47-50K-S	Q11-123	TA14L	Master AGC
B	Shaft		Not Reg.	AK-19	RN-3	TQ	Not Reg.	Attach to R8A.
R9	750Ω	2	A10D-25857		39-750			Buzz-Wire Wound
R10A	3Meg	½	B1GA-25867	B-84-S	A47-3Meg-S	Q11-140	U-39	Tuner AGC
B	Shaft		Not Reg.	Not Reg.	ES5-3	Not Reg.	Not Reg.	Attach to R10A.
C	Switch		Not Reg.	Not Reg.	SWE-12	T6-1	UX-26	Attach to R10A.

* Connect a 330Ω resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (viewed from shaft end, terminals down).
≠ Concentrikit Equivalent, K-7 Kit, Base Elements and Shafts: B11-123 & P17-113 (Panel) B13-137 & K2-124 (Rear) T6-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RAYTHEON PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R11	680KΩ			BTS-680K	
R12	680KΩ			BTS-680K	
R13	10KΩ				
R14	10KΩ				
R15	680KΩ			BTS-680K	
R16	100KΩ			BTS-100K	
R17	820KΩ			BTS-820K	
R18	180KΩ			BTS-180K	
R19	680Ω			BTS-680	
R20	4700Ω			BTS-4700	
R21	220KΩ			BTS-220K	
R22	10KΩ			BTS-10K	
R23	3300Ω	1		BTA-3300	
R24	100KΩ			BTS-100K	
R25	10KΩ			BTS-10K	
R26	6200Ω			BTS-6200	
R27	100KΩ			BTS-100K	
R28	10Meg			BTS-10Meg	Note 1
R29	1.5Meg			BTS-1.5Meg	Note 2
R30	1000Ω			BTS-1000	
R31	4700Ω			BTS-4700	
R32	1000Ω			BTS-1000	
R33	47Ω			BTS-47	
R34	1000Ω			BTS-1000	
R35	47KΩ			BTS-47K	
R36	1000Ω			BTS-1000	
R37	47Ω			BTS-47	
R38	2700Ω	2	9C1B-1104		
R39	47KΩ				
R40	1000Ω				
R41	150Ω			BTS-150	
R42	3900Ω			BTS-3900	
R43	22KΩ			BTS-22K	
R44	2700Ω	2		BTS-2700	
R45	2700Ω	2		BTS-2700	
R46	1000Ω			BTS-1000	
R47	100KΩ			BTS-100K	
R48	33KΩ			BTS-33K	
R49	100KΩ			BTS-100K	
R50	100KΩ			BTS-100K	
R51	680KΩ			BTS-680K	
R52	680KΩ			BTS-680K	Note 3

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RAYTHEON PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R53	470KΩ			BTS-470K	Note 4
R54	100KΩ			BTS-100K	
R55	330KΩ			BTS-330K	
R56	470KΩ			BTS-470K	
R57	33KΩ	1		BTA-33K	
R58	47Ω			BTS-47	
R59	680Ω			BTS-680	
R60	330KΩ			BTS-330K	
R61	185Ω	2		BTS-185	
R62	33KΩ			BTS-33K	
R63	150Ω	1		BTA-150	
R64	33KΩ			BTS-33K	
R65A	330KΩ		†1TA-34313	BTS-330K	
	B(2.2Meg			BTS-2.2Meg	
R66	100KΩ			BTS-100K	
R67	150KΩ			BTS-150K	
R68	33KΩ			BTS-33K	
R69	1Meg			BTS-1Meg	
R70	47000Ω	1		BTA-4700	
R71	1000Ω			BTS-1000	
R72A	33KΩ			BTS-33K	
B	82000Ω		≠1TA-33378	BTS-8200	
C	8200Ω			BTS-8200	
R73	100KΩ			BTS-100K	
R74	4700Ω			BTS-4700	
R75	68KΩ			BTS-68K	Note 5
R76	2.2Meg			BTS-2.2Meg	
R77	220KΩ			BTS-220K	
R78	3.3Meg			BTS-3.3Meg	
R79	100KΩ			BTS-100K	
R80	4700Ω	5	9C1B-1107		

Note 1. Some versions use an 8.2Meg 1W resistor in this application.
Note 2. Some versions use a 1.8Meg 1W resistor in this application.
Note 3. Some versions use a 1Meg 1W resistor in this application.
Note 4. Some versions use a 390KΩ 1W resistor in this application.
Note 5. Some versions use an 82KΩ 1W resistor in this application , and other versions use a 75KΩ 5% 1W resistor in this application.
Note 6. Not used in some versions.
† Items R65A, R65B, C75A, C75B, C75C are combined in one unit.
≠ Items R72A, R72B, R72C, C77A, C77B, C77C are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA RAYTHEON Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T1	117VAC	12.6VCT	12.6V		12D-25564					
	③.73A	↓4.6A	③.60A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	12E-25424	FB448 *	HVO-58 *		X126 ②		FLY-80 *	D-83 *
T3	Vert. Output Trans.	12E-19048-2	Z1900L ②	A-3038 ②	22271 ③	V305 ②	A-8143 ②	26853 ②	A-99X ②
T4A	Yoke(90°) Horiz.(10MH)	20L-25380 ②	DP907 ③	MDF-43 ③	2252L ③	Y90F19/43	DY-16A ③	Y-16 ③	Y-41-1 ③
B	Vert.(40MH)	16M-25770 ③	③	③	③	③	③	③	③

① Use 10 to 1 turns ratio.
② Connect as auto transformer.
③ Drill new mounting hole(s)
④ Includes capacitor C105, resistors R81 and R82.
⑤ Yoke rear cover and centering device.
⑥ Use original rear cover and centering device.
⑦ Loosen and rotate core clamp to duplicate original mounting.
⑧ Connect horizontal damping network across terminals #3 and #7. Use original if necessary.
⑨ Use original horizontal yoke damping network if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rom Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	8	8	8	8	8	8	8
3	3	6	6	6	6	6	3
2	3	6	6	6	6	6	3
6	6	See Note ⑭ 3	3	See Note ⑭ 3	3	See Note ⑭ 3	6
1	3	2	2	3	3	3	2
Special Notes	⑩	⑩	⑪	⑪	⑩	⑩	⑩

⑩ Change AGC coupling capacitor C61 to approximately 30 to 70MMF @ 3KV.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6.5KΩ	3-4Ω	12C-34170	Z1004	A3921	A3976	24H55	S-51X	① Used in Chassis 21T43 and 21T44.
	6.7KΩ	3-4Ω	12C-34691 ①	Z1U13 ②	A3Q20 ③	A3980	26H48 ③	X-9X	② Use 4Ω tap. ③ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA RAYTHEON PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	5"	PM	3-4Ω	18A-25935 ①	5A07	20S52	① Used in Models M-210-M, M-210-B, M-211-M, UM-211-B.
	4"	PM	6-8Ω	18A-25948 ②	4A07Z6.4		② Used in Models C-216-M, C-216-B.
	6"	PM	3-4Ω	18A-25937 ③	6A1	22S51	③ Used in Models UC-217-M, UC-217B, C-218, UC-219.
	6"x 9"	PM	3-4Ω	18A-25936 ④	69A2	23S51	④ Used in Models UC-213-M, UC-213-B.
	10"	PM	6-8Ω	18A-25950 ⑤	10A12E6.4	21S51	⑤ Used in Models C-214-M, C-214-B, UC-215-M, UC-215-B.
	10"	PM	3-4Ω	18A-25951 ⑥	10A31	23S51	⑥ Used in Models C-216-M, C-216-B, UC-217-M, UC-217-B. ⑦ Used in Models C-218, UC-219.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF IF Coil	0Ω		107B-25761				
L2A	Fil. Choke	0Ω						
B	Fil. Choke	0Ω		107B-25766				
L3	Cathode Choke	0Ω		107B-25765				
L4	UHF Osc. Coil	0Ω		107B-25764				
L5	UHF IF Coil	0Ω		107B-25763				
L6	UHF IF Coil	0Ω		107B-25762				
L7A	VHF Ant. Trans	0Ω	0Ω					
B	VHF Ant.Trans	0Ω	0Ω	107B-25754				
L8	IF Trap	.2Ω		107B-25757				
L9	FM Trap	0Ω		107B-25756				
L10A	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-2				Channel 2
B	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-3				Channel 3
C	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-4				Channel 4
D	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-5				Channel 5
E	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-6				Channel 6
F	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-7				Channel 7
G	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-8				Channel 8
H	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-9				Channel 9
I	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-10				Channel 10
J	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-11				Channel 11
K	VHF Ant, RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-12				Channel 12
L	VHF Ant., RF, Mixer Grid, Osc. Coils	0Ω		107B-25755-13				Channel 13 Includes 3700Ω resistor
M	UHF IF Strip	0Ω		107B-25760				
L11	Fil. Choke	0Ω		107B-25767				
L12	Neut. Coil	0Ω		106-25255				
L13	RF Coil	0Ω		107B-25758				
L14	Conv. Plate	.1Ω		107B-25759				
L15	RF Choke	2Ω		301-15608		19-6033	6636	20 Microhenries;Used in chassis 21T41, 21T44, 21T46
L16	1st Video IF			13A-24203				Includes 41.25MC Trap and Cap.
L17	2nd Video IF	.1Ω	.1Ω	13A-24224	17-5001 *	TV-125 *	6231 *	
L18	3rd Video IF	.1Ω	.1Ω	13A-24027	17-5003 *	TV-128 *	6233 *	Includes 47.25MC Trap
L19	Series Peaking Coil	L 7		16A-23427		19-1004	6610	7.5 Microhenries
L20	Shunt Peaking Coil	4.8Ω		16A-24998		19-3125	6120	140 Microhenries
L21A	4.5MC Trap	1.8Ω		201-23729				
B	1st Sound IF	2.8Ω						
L22	Series Peaking Coil	5.8Ω		16A-24030		TV-124	6180	170 Microhenries
L23	Shunt Peaking Coil	10.8Ω		16A-24019		19-3500	6136	480 Microhenries
L24	4.5MC Trap	1Ω		13A-23641				
L25	2nd Sound IF	.3Ω	.3Ω	201-23873				
L26	Quadrature Coil	4.8Ω		201-23727			1480	
L27	RF Choke	1.2Ω		16A-21701		19-1006	4613	

* Cut out chassis hole and use adaptor plate.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Rom PART No.	Thordarson PART No.	Triad PART No.	NOTES
L28	25Ω	63Ω	201-24472			6312					Horiz. Osc.
L29	37Ω		201-24473-2			6314					Horiz. Phase

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L30	.320A	45Ω	L 5HY	16B-25146	C5037	C2998	C2326	28C44	C-17X

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA RAYTHEON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.320A	21J25315	1241A	MR350	68350	6QA2	350A	
M2	.320A	31J25315	1241A	MR350	68350	6QA2	350A	

PARTS LIST AND DESCRIPTIONS (Continued)

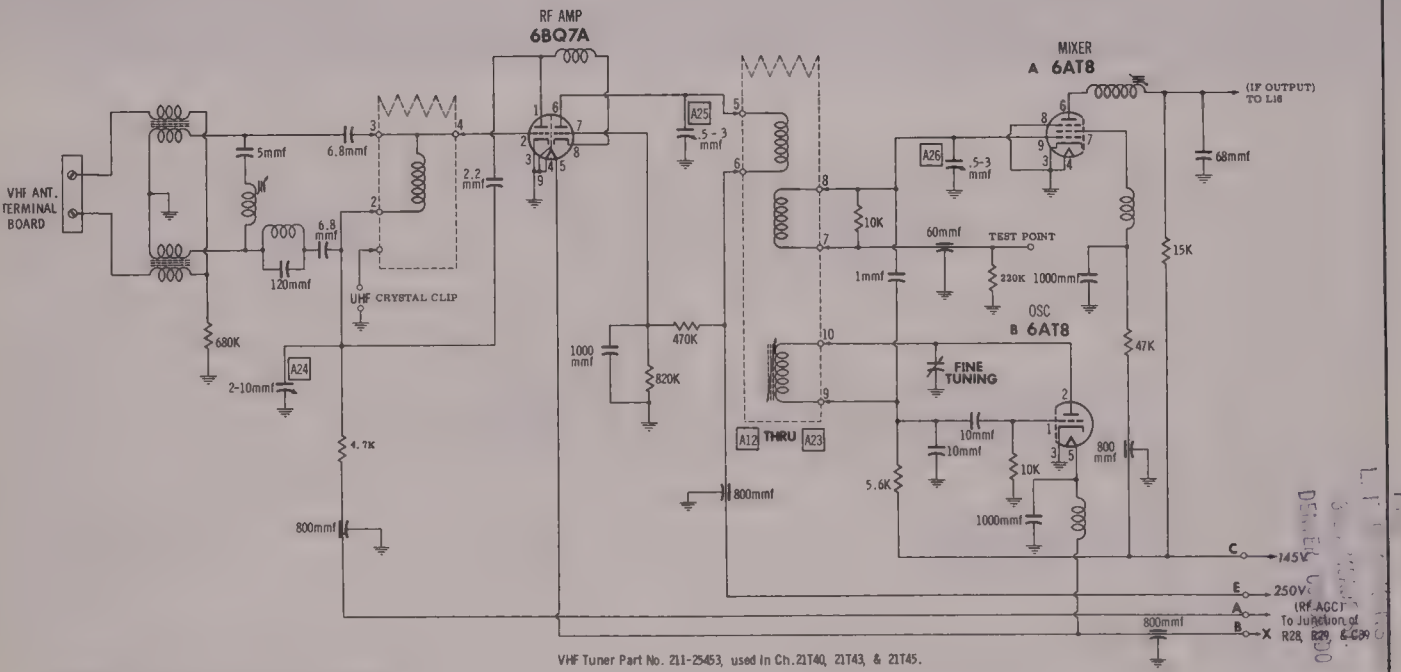
CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA		NOTES
		RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N82A	51K-111	1N81 or 1N82A	UHF Mixer (Clip in)
M4	1N295 *		1N60	Video Det. (Pigtail)

* Some versions may use crystal diode type CK-706 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	RAYTHEON PART No.	NOTES
M5	Circuit Breaker	20F-25568	Low Voltage Protection
M6	Dial Light	46A-10783	#47
M7	Tuner	21J-25475	VHF-UHF combination - Chassis 21T41, 21T44, 21T46
	Tuner	21J-25453	VHF only - Chassis 21T40, 21T43, 21T45
M8	Video Det. Assy.	13B-24306-1	Includes M4, coils and capacitors
M9	Centering Device	16M-23770	Includes deflection yoke (Y4) rear cover
M10	Width Control	2C-25229	
M11	Ion Trap	16M-19705	
M12	Correction Magnet	B16M-23878	
	Cabinet	20D-25978	Models M210-M, UM-21I-M
	Cabinet	20D-25978-1	Models M-210-B, UM-21I-B
	Cabinet	20D-25979	Model UC-213-M
	Cabinet	20D-25979-1	Model UC-213-B
	Cabinet	20D-25980	Models C-214-M, UC-215-M
	Cabinet	20D-25980-1	Models C-214-B, UC-215-B
	Cabinet	34D-26047	Models C-215-M, UC-217-M
	Cabinet	34D-26048	Models C-216-B, UC-217-B
	Cabinet	34D-26046	Models C-218, UC-219
	Knob	53-25897-A29	Brightness
	Knob	53-25899-A194	On-off-volume - Models M-210-M,M-210-B, UM-21I-M, UM-21I-B, UC-213-B, C-214-B, UC-215-B, C-216-B, UC-217-B
	Knob	53-25899-A195	On-off-volume - Models UC-213-M, C-214-M, UC-215-M, C-216-M, UC-217-M, C-218, UC-219
	Knob	53-25903-A194	Horiz. hold - Models M-210-M, M-210-B, UM-21I-M, UM-21I-B, UC-213-B, C-214-B, UC-215-B, C-216-B, UC-217-B
	Knob	53-25903-A195	Horiz. Hold - Models UC-213-M, C-214-M, UC-215-M, C-216-M, UC-217-M, C-218, UC-219
	Knob	53-25924-A194	Picture - Models M-210-M, M-210-B, UM-21I-M, UM-21I-B, UC-213-B, C-214-B, UC-215-B, C-216-B, UC-217-B
	Knob	53-25924-A195	Picture - Models UC-213-M, C-214-M, UC-215-M, C-216-M, UC-217-M, C-218, UC-219
	Knob	53-25900-A194	Vert. hold - Models M-210-M, M-210-B, UM-21I-M, UM-21I-B, UC-213-B, C-214-B, UC-215-B, C-216-B, UC-217-B
	Knob	53-25900-A195	Vert. hold - Models UC-213-M, C-214-M, UC-215-M, C-216-M, UC-217-M, C-218, UC-219
	Knob	53-25905-A194	Tone - Models M-210-M, M-210-B, UM-21I-M, UM-21I-B, UC-213-B, C-214-B, UC-215-B, C-216-B, UC-217-B
	Knob	53-25905-A195	Tone - Models UC-213-M, C-214-M, UC-215-M, C-216-M, UC-217-M, C-218, UC-219
	Knob	53-25896-A29	Fine tuning - Models M-210-M, M-210-B, C-214-M, C-214-B, C-216-M, C-216-B, C-218
	Knob	53-25938-A29	Fine tuning - Models UM-21I-M, UM-21I-B, UC-213-M, UC-213-B, UC-215-M, UC-215-B, UC-217-M, UC-217-B, UC-219
	Knob	53-25896-A194	VHF Station Selector - Models M-210-M, M-210-B, C-214-B, C-216-B
	Knob	53-25898-A195	VHF Station Selector - Models C-214-M, C-216-M, C-218
	Knob	53-25939-A194	VHF Station Selector - Models UM-21I-M, UM-21I-B, UC-213-B, UC-215-B, UC-217-B
	Knob	53-25939-A195	VHF Station Selector - Models UC-213-M, UC-215-M, UC-217-M, UC-219
	Knob	53-25940-A194	UHF Indicator - Models UM-21I-M, UM-21I-B, UC-213-B, UC-215-B, UC-217-B
	Knob	53-25940-A195	UHF Indicator - Models UC-213-M, UC-215-M, UC-217-M, UC-219
	Pointer	2G-25685	For all VHF-UHF Models
	Safety Glass	30M-25931	



VHF Tuner Part No. 211-25453, used in Ch. 21T40, 21T43, & 21T45.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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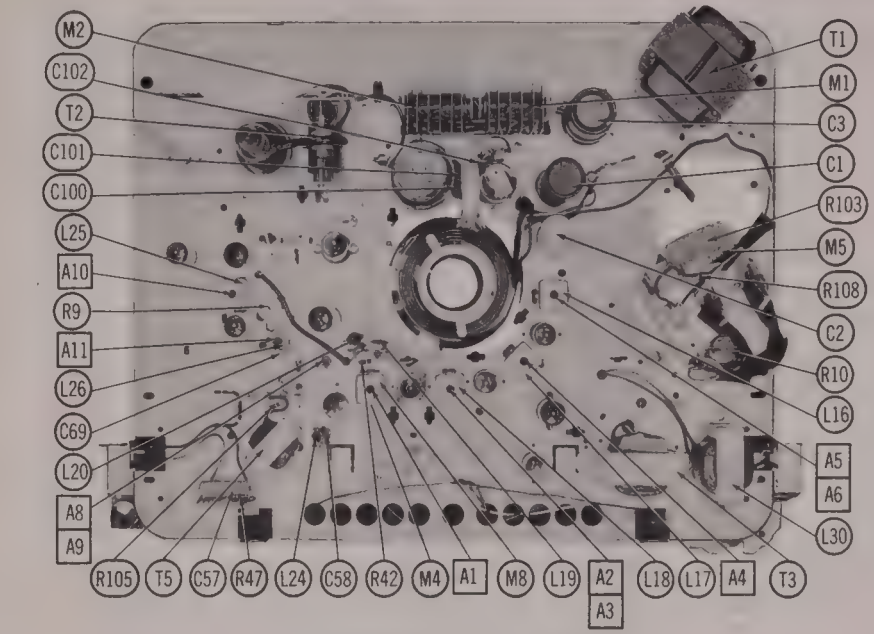
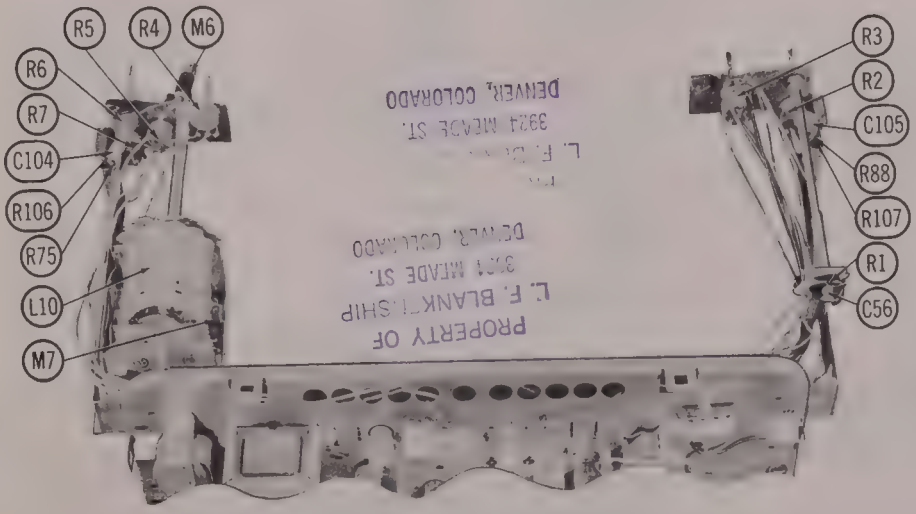
ALTERNATE TUNER SCHEMATIC



CHASSIS - TOP VIEW



PROPERTY OF
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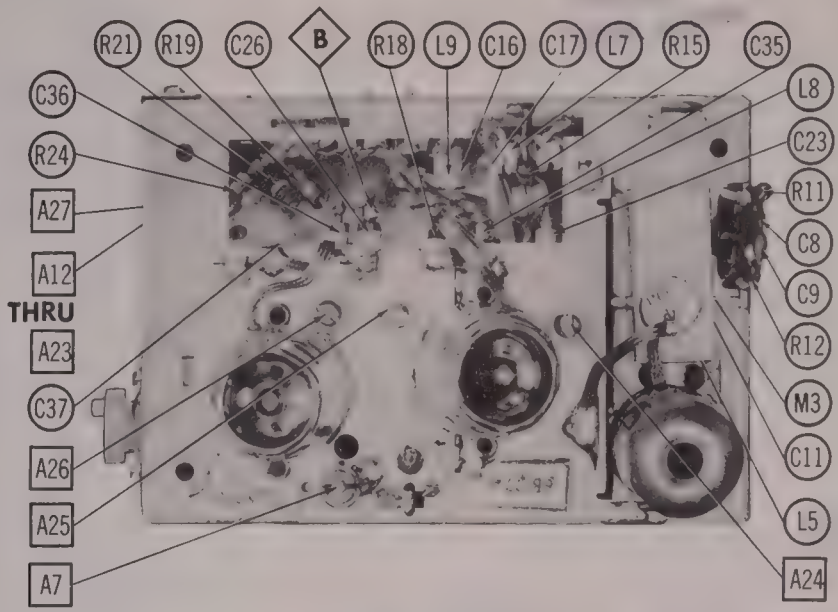
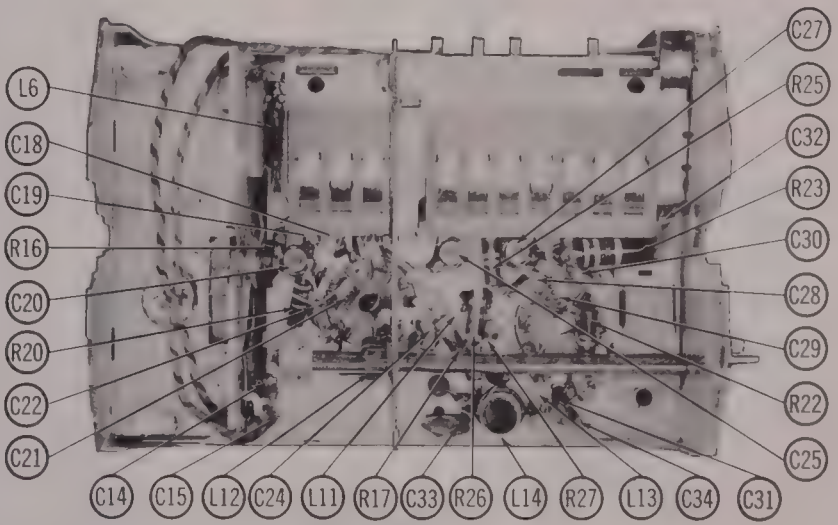
DENVER, COLORADO

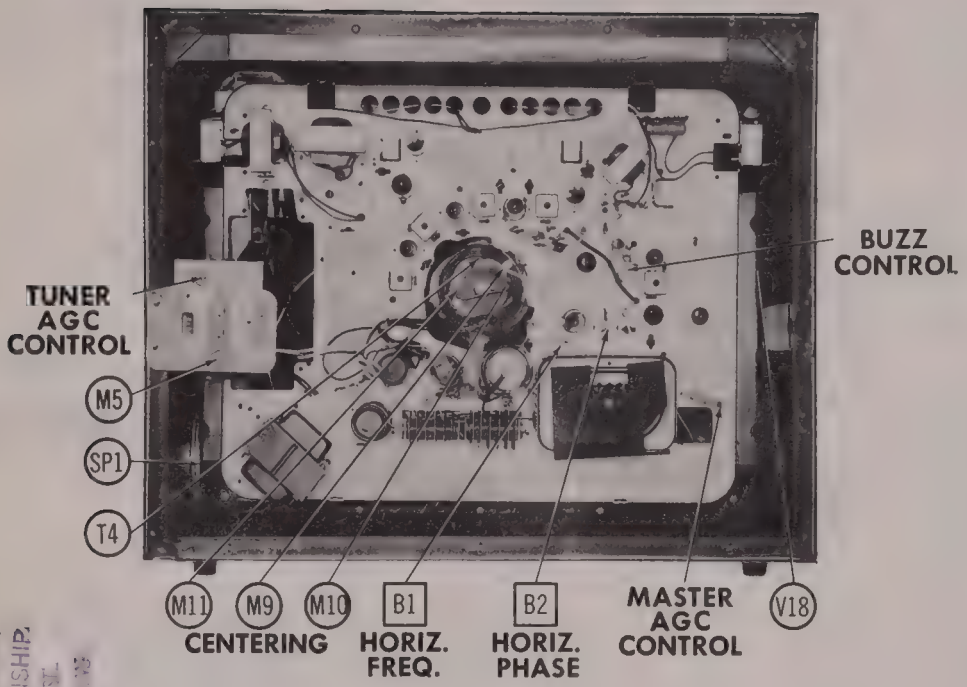
TUNER & CONTROL ASSEMBLY



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



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CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control (R2) to its mid-range position.

Connect a short clip lead across L29. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Remove the clip lead from L29. Connect the vertical amplifier of the oscilloscope thru a low capacity probe to point ⊕. Low side to chassis. Adjust the horizontal phase slug (B2) until waveform similar to Fig. 8 is obtained. While making this adjustment, keep the picture in sync with the horizontal hold control (R2). Remove the scope connection. Check the range of the horizontal hold control. Turn R2 fully counter clockwise then back fully clockwise. The picture should fall out of sync at each extreme setting of R2.

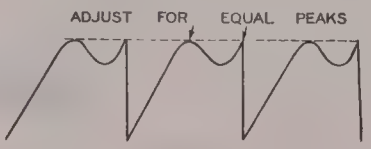

FIG. 8

PROPERTY OF
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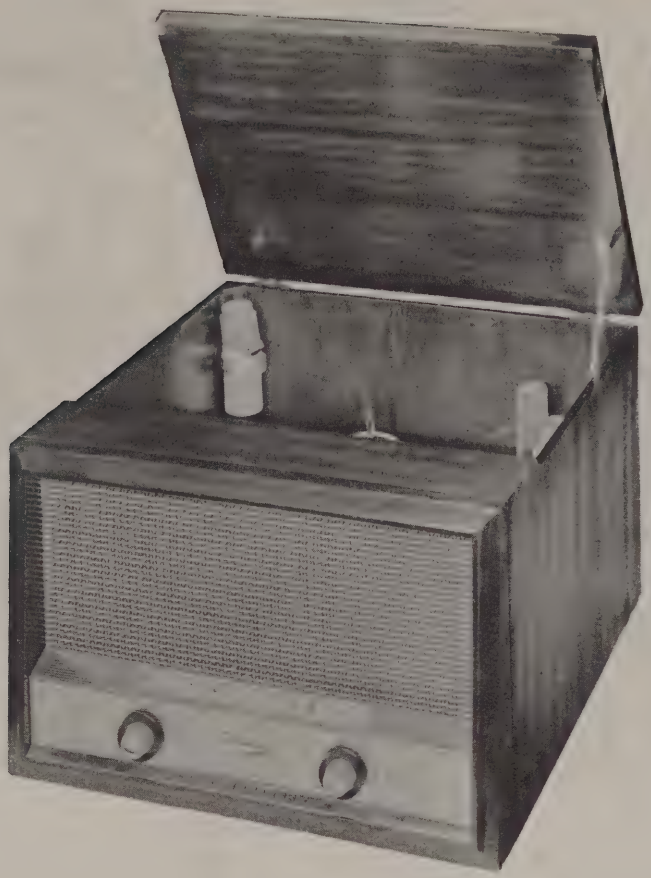
3326 MEADE ST.
DENVER, COLORADO

SILVERTONE MODELS 6045, 6046 (Ch. 528.34900)



SILVERTONE MODELS 6045, 6046 (Ch. 528.34900)

TRADE NAME	Silvertone Models 6045, 6046 (Ch. 528.34900)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with 3 Speed Automatic Record Changer
TUBES (Six)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det. -AVC-AF Amp., 12AT6 Phase Inverter, (2) 35C5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.29 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1630KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FOR SERVICE INFORMATION ON RECORD CHANGER MODEL 567.37008-SEE SIMILAR CRESCENT 500 SERIES-PHOTOFACT SET 197-FOLDER 4 OR RECORD CHANGER MANUAL CM-5.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

SILVERTONE
Model 6045 (Ch. 528.34900)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AT6	

ITEM No.	USE	TYPE	NOTES
V4	Phase Inverter	12AT6	
V5	Output	35C5	
V6	Output	35C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	18-304	PRS150V3050	BBRD5315	TCD497	TDLD-8	FMD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200	16-197	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	47		15-299	NPO-DI47	TCZ-47	Z033	NPO-338-470	ZT-5447	5TCC-Q47	
C4	.05	200	16-197	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C5	.05	400	16-189	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	150		15-251	BPD-00015	DD-151	TP36	811-151	UC-5315	5GA-T15	
C7	25	500	15-256	SI-25	D6-250	TP25	GP1K-250	UC-5425	5GA-Q25	
C8	.02	400	16-150	BPD-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C9	5000		15-320	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	Note 1
C10	.003	600	16-200	BPD-003	DD-302	K076	811-003	UC-523	5GA-D3	
C11	.1	200	16-203	P288N-1	DF-104	CUB2P1	UC-523	PT401	4TM-P1	
C12A	10000									
B	250		†17-110	†PA-112-4	† PC-81	† 113TM2	† 1404-02		† T-2	
C										
C13	5000		15-320	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C14A	10000									
B	250		♦17-110	♦PA-112-4	♦PC-81	♦113TM2	♦1404-02		♦T-2	
C										
C15	.001	600	16-254	BPD-001	DD-102	CUB6D1	GP3-333-103	PT621	6TM-D1	
C16	.001	600	16-254	BPD-001	DD-102	CUB6D1	GP3-333-103	PT621	6TM-D1	
C17	.047	400	16-447	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C18	.05	400	16-189	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

Note 1. Some versions may use .02MFD (Part No. 15-240) in this application.
† Items C12A, C12B, C12C, R10A, and R10B are combined in one unit. When replacing items separately, C12B and C12C should total 250MMF.
♦ Items C14A, C14B, C14C, R11A, and R11B are combined in one unit. When replacing items separately, C14B and C14C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ		A24-224	F1-40		* QJ-764	UF55L	Tone (Panel)
B	1Meg			R2-61			UR16-T125†	Volume (Rear) Tapped @ 90KΩ
C	Switch			KB-1			US-26	Attach to R1B

† Universal Replacement (Mallory Exact Duplicate Part No. UE148IS).
* Concentrikit Equivalent, K-7 Kit, Base Elements and Shafts; B13-133 & P13-200 (Panel)
B18-137X & R2-220 (Rear)
76-1 (Switch)

RESISTORS

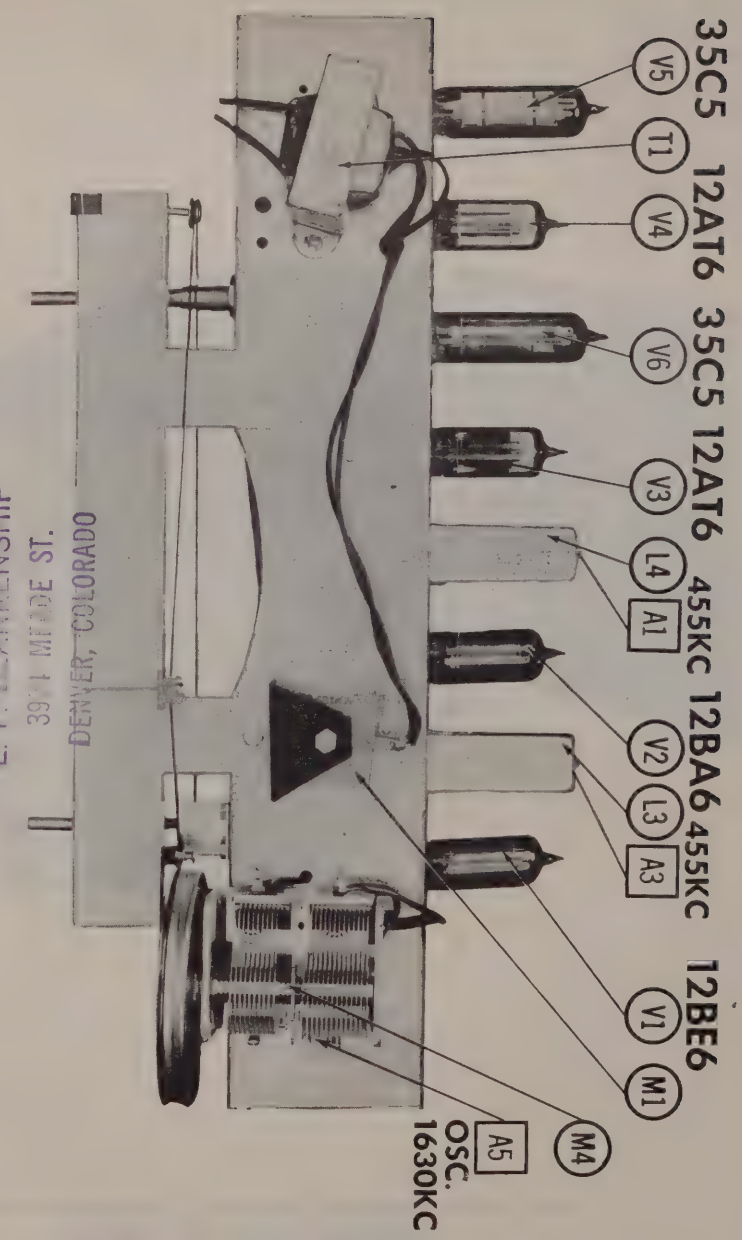
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	22KΩ		602230M	BTS-22K	
R3	82Ω		608200K	BTS-82	
R4	1Meg		601050M	BTS-1Meg	
R5	47KΩ		604730M	BTS-47K	
R6	22KΩ		602230M	BTS-22K	
R7	10Meg		601060M	BTS-10Meg	
R8	100KΩ		601040M	BTS-100K	
R9	10Meg		601060M	BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R10A	500KΩ		†17-110	BTS-470K	
B	250KΩ			BTS-270K	
R11A	500KΩ		♦17-110	BTS-470K	
B	250KΩ			BTS-270K	
R12	220KΩ		602240M	BTS-220K	
R13	100Ω		601010K	BTS-100	
R14	1200Ω	1	601221K	BTA-1200	
R15	33Ω	3	61-10		
R16	220KΩ		602240M	BTS-220K	

† Items R10A, R10B, C12A, C12B, C12C are combined in one unit.
♦ Items R11A, R11B, C14A, C14B, C14C are combined in one unit.

CHASSIS—TOP VIEW



PROPERTY OF
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3911 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5.6KΩ	6-8Ω	80-295	Z1007	A-2901	A-3823	22S61	S-53X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6"	PM	3-4Ω	79-417	6A1LF		
SP2	6"	PM	3-4Ω	79-417	6A1LF		

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.6Ω		82-72				
L2	Osc. Coil	.9Ω	8.5Ω	10-645	14-1074	BC-381 *	70-Osc.	
L3	Input IF	20Ω	20Ω	10-508	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	10-479	16-6758	BC-353	12-C2	

* Drill mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.082A	83-780	1004A	RS100	6S100	5M1	100	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	Y720087	55-T	GD-J	47	0-1 or S-1 and 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

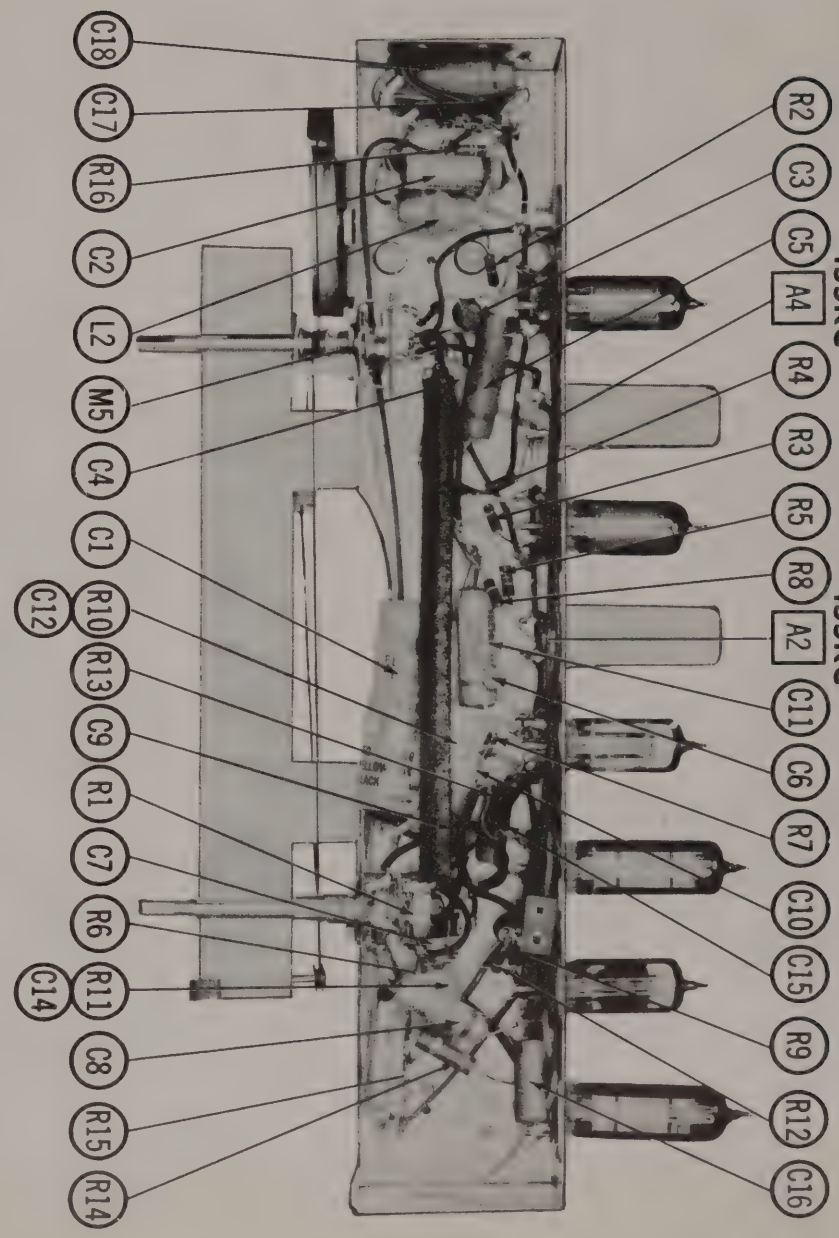
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	SILVERTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M3	5742	* S-67 or † S-66 or ♦†S-66SD or ♦ S-66D	† AC-434 or ♦†AC-434D1 or †♦AC-434D2 or ♦ AC-434D	† W-75TPS or ♦†W-75DS or ♦ W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning Cap.	19-231	2 Gang (11-475MMF, 15-185MMF)
M5	Switch	69-203	Radio-Phono (DPDT, Rotary, Wafer Type)
	Cabinet	42-727	Model 6045
	Cabinet	42-735	Model 6046
	Knob	52-568	Tuning & Tone
	Knob	52-569	On-Off-Volume & Radio-Phono Switch
	Dial Scale	67-586	
	Dial Pointer	58-111	

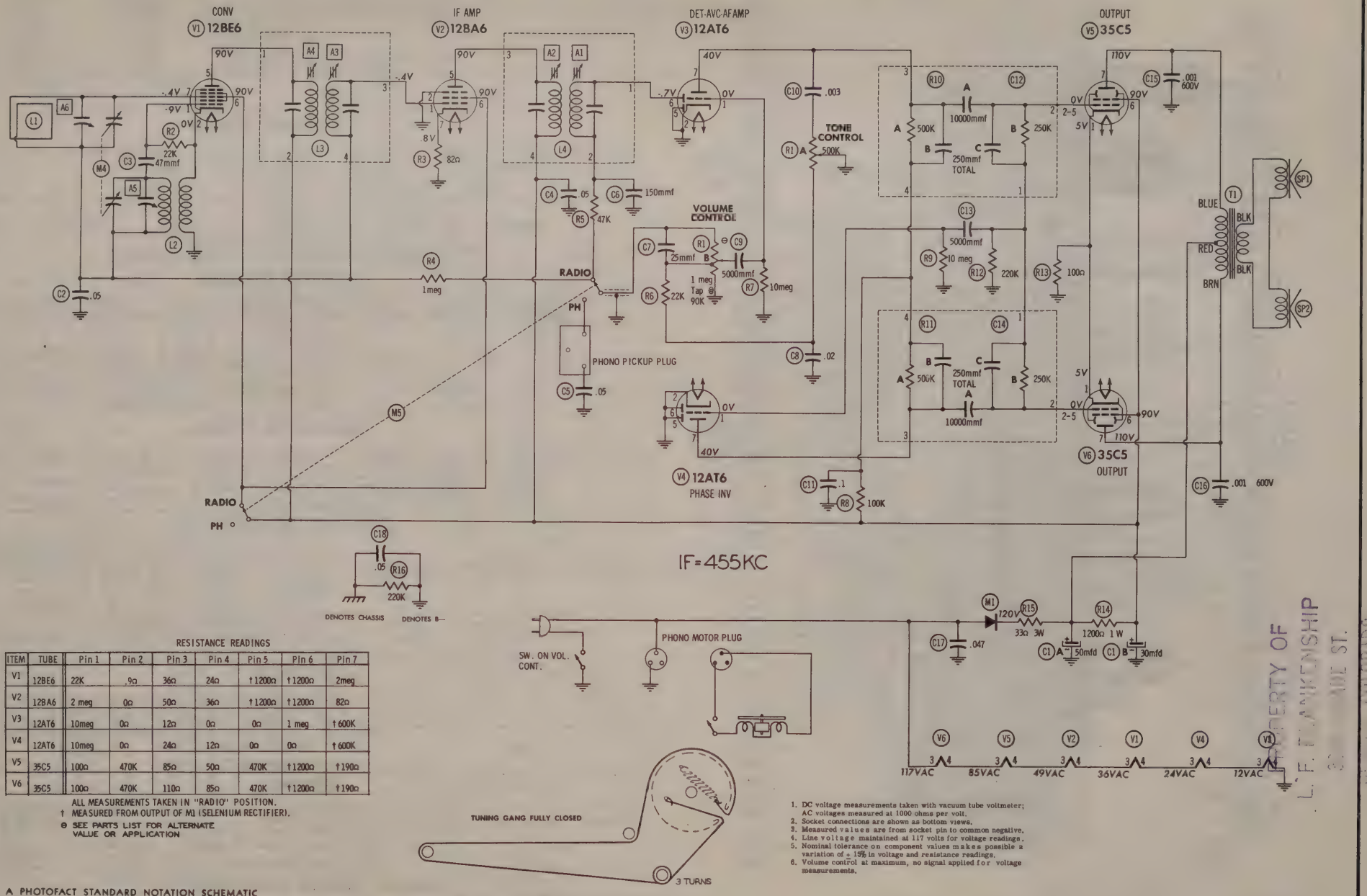
CHASSIS—BOTTOM VIEW



SET 327 FOLDER 13

SILVERTONE
Model 6045 (Ch. 528. 34900)

SILVERTONE
Model 6045 (Ch. 528. 34900)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.9Ω	36Ω	24Ω	†1200Ω	†1200Ω	2meg
V2	12BA6	2 meg	0Ω	50Ω	36Ω	†1200Ω	†1200Ω	82Ω
V3	12AT6	10meg	0Ω	12Ω	0Ω	0Ω	1 meg	†600K
V4	12AT6	10meg	0Ω	24Ω	12Ω	0Ω	0Ω	†600K
V5	35C5	100Ω	470K	85Ω	50Ω	470K	†1200Ω	†190Ω
V6	35C5	100Ω	470K	110Ω	85Ω	470K	†1200Ω	†190Ω

ALL MEASUREMENTS TAKEN IN "RADIO" POSITION.
† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER).
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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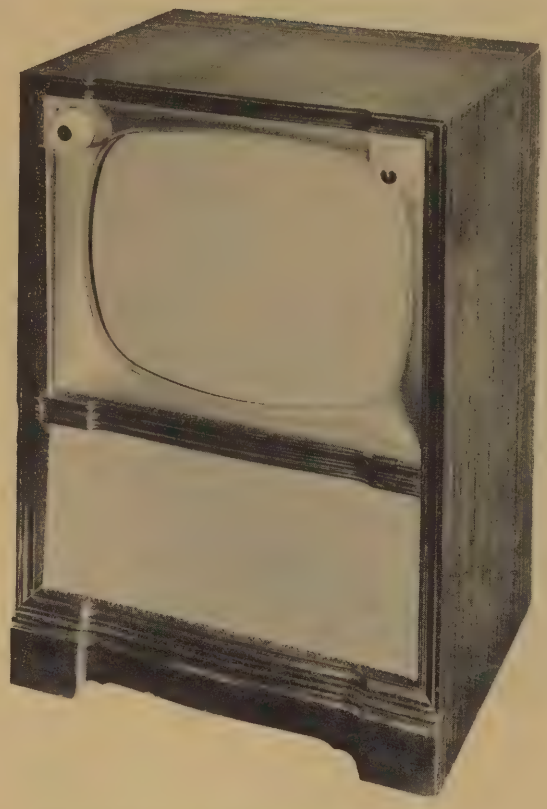

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TRUETONE MODELS
2D1634A, 2D1636A, 2D2634A

TRUETONE MODEL 2D1636A

TRADE NAME	Truetone Models 2D1634A, 2D1636A, 2D2634A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel.

2. Remove 5 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 2 wood screws holding antenna terminal bracket.

5. Remove 6 chassis mounting board bolts holding chassis mounting board to cabinet, and 2 wood screws from 2 brackets at top of cabinet.

6. Slide chassis with mounting board from cabinet.

7. Remove 4 speed nuts. Remove speaker.

MODELS
2D1634A, 2D1636A, 2D2634A

TRUETONE MODELS
2D1634A, 2D1636A, 2D2634A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 7 push-on type control knobs from front panel of cabinet. Remove 2 metal screws from each cover escutcheon panel. Remove panels and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L27) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to the chassis. Adjust the buzz control (R10) for maximum sound and MINIMUM buzz.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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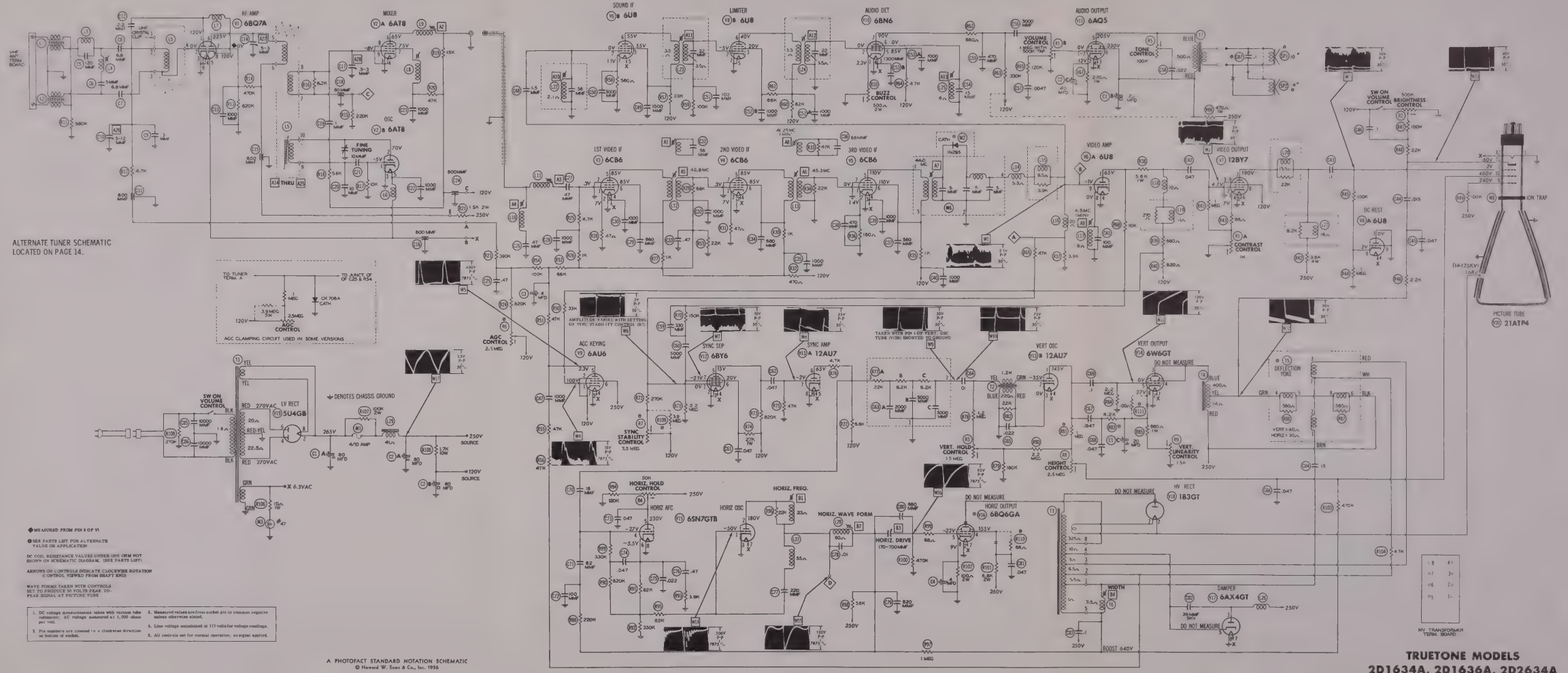
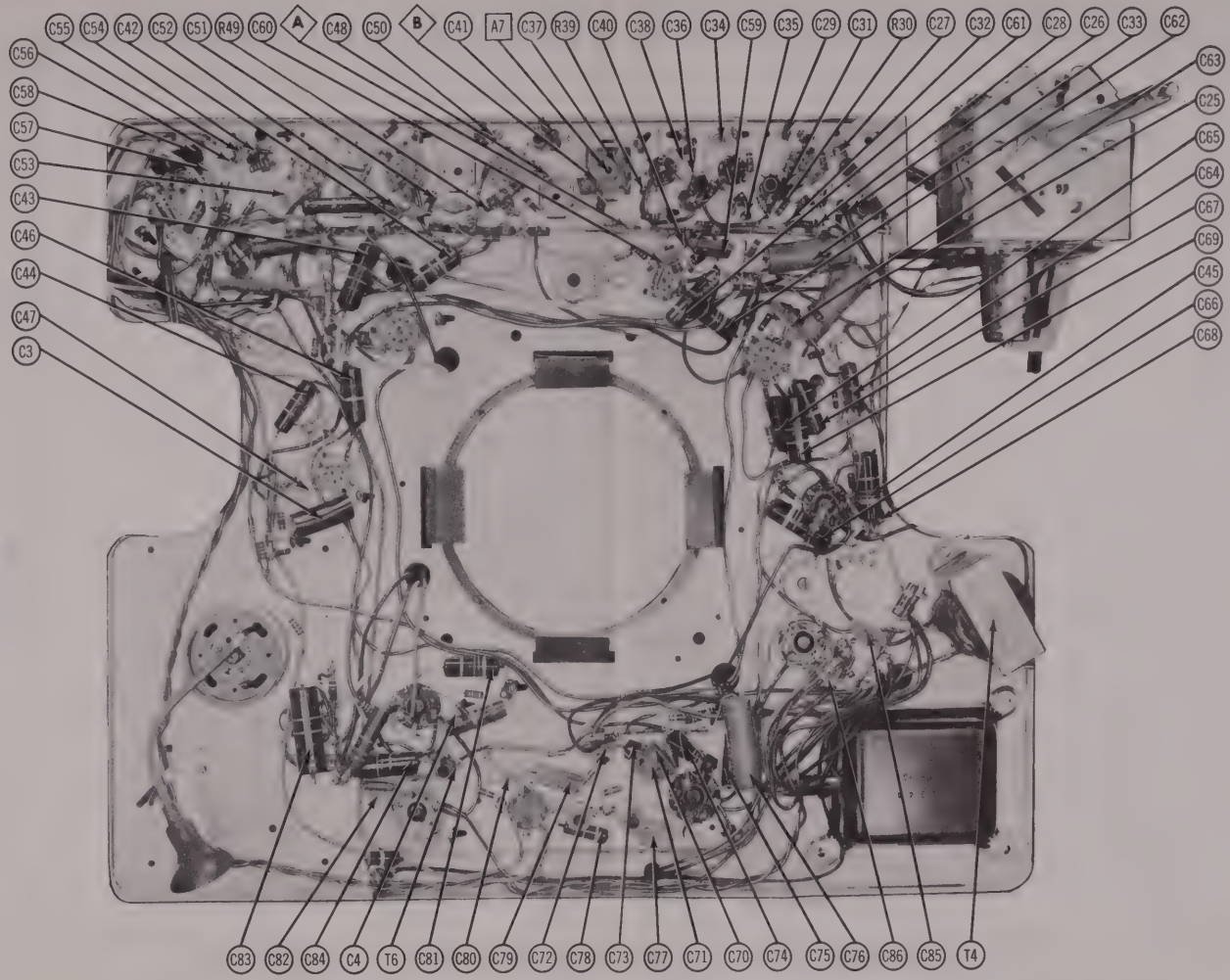


TRUETONE MODELS
2D1634A, 2D1636A, 2D2634A

TRUETONE MODELS
2D1634A, 2D1636A, 2D2634A



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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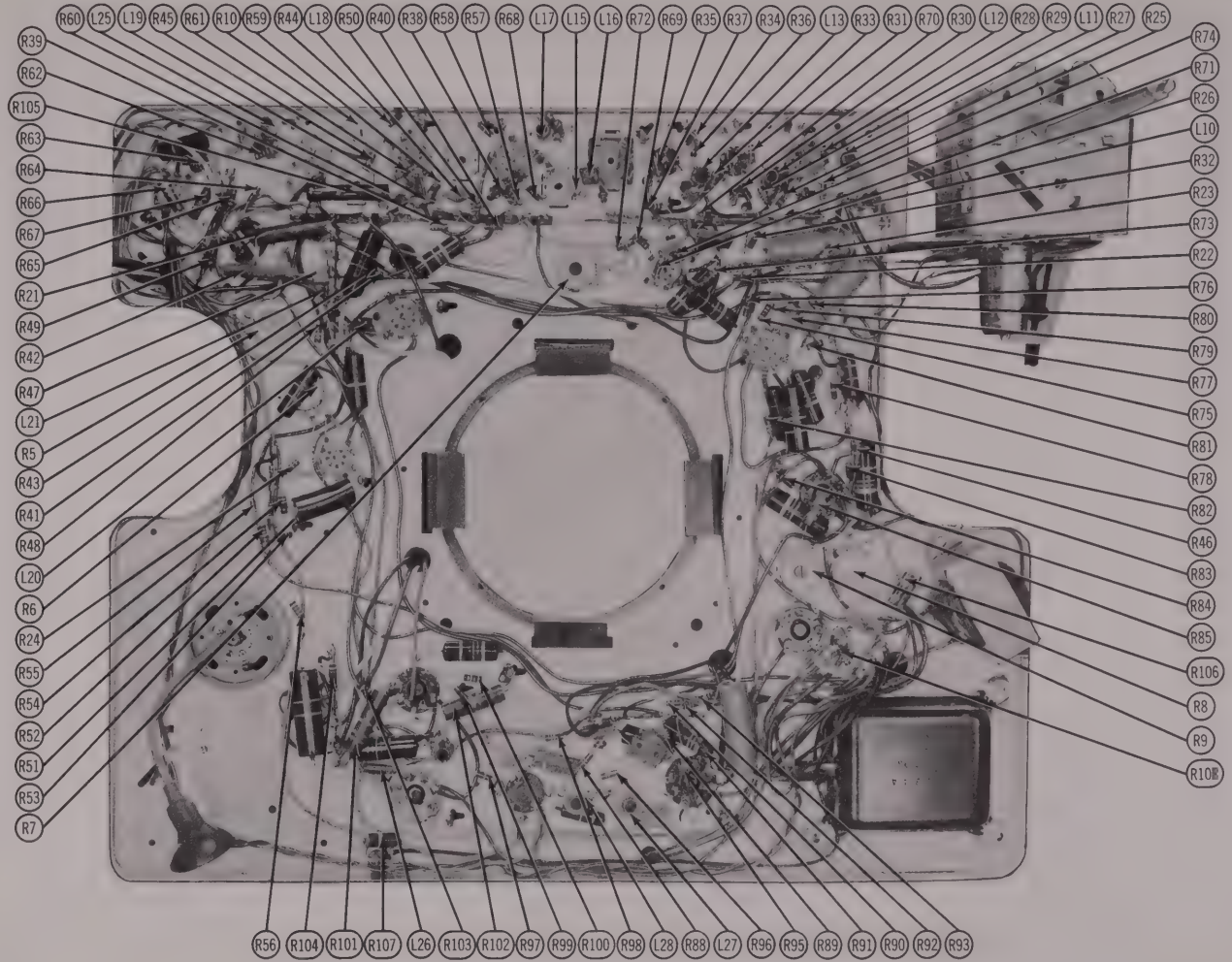
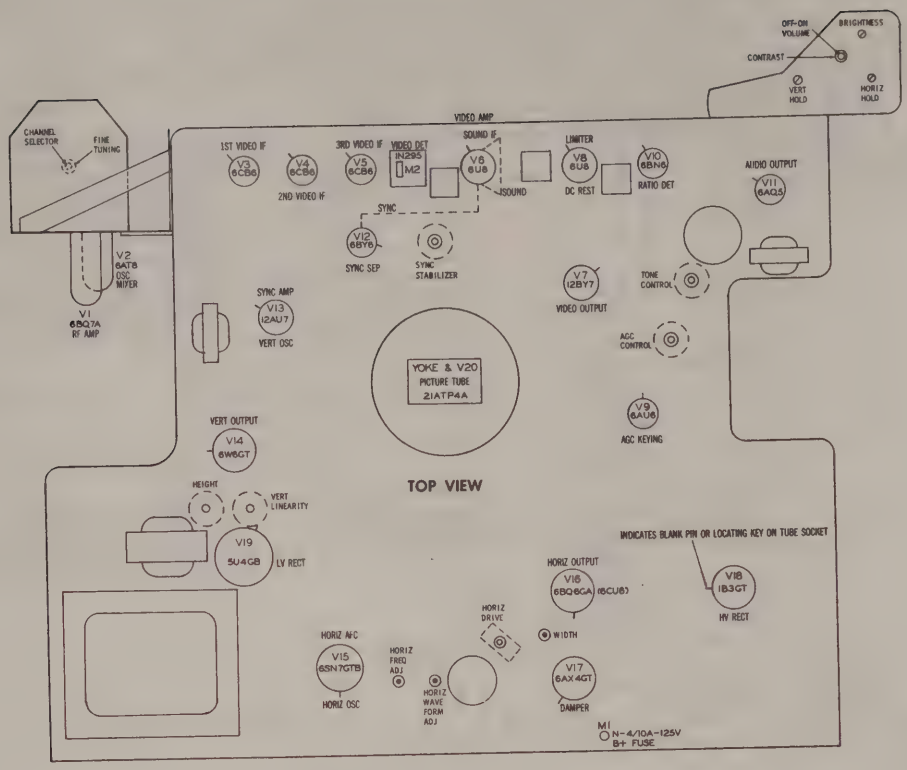


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V8, V20
Has pic, no sound - V6, V9, V10, V11
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V13
No horiz. sync - V13, V15
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V13
Horiz. off freq. - V13, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage leads should be securely taped away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C32. Connect the positive lead to chassis.
Use only enough generator output to provide usable indication on the scope or VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2).	44MC (10MC Swp.)	41.25MC 45.75MC 47.25MC	Any unused channel	Vert. Amp. thru detector (Fig. 1) to pin 5 of 6CB6 (V3). Low side to chassis.	A1, A2, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3, and A4 for response similar to Fig. 2. A2 and A3 affect the flat portion of the curve. A4 positions the 41.25MC marker. Make sure 45.75MC marker is on peak of curve as shown or 44.5MC marker will be incorrect on overall response curve.
2.	"	"	Not used	42.8MC (Unmod.)	"	Use VTVM. DC probe to point (A). Low side to chassis.	A5	Increase bias to 4.5 volts. Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
3.	"	"	Not used	45.3MC (Unmod.)	"	"	A6	"
4.	"	"	"	44MC (Unmod.)	"	"	A7	"
5.	"	"	"	41.25MC (Unmod.)	"	"	A8	Adjust for MINIMUM deflection.
6.	"	"	44MC (10MC Swp.)	41.25MC 42.25MC 42.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching, step 1 should be repeated.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	10KΩ	High side thru 10KΩ to point (B). Low side to chassis.	4.5MC (Unmod.)	Any unused channel	DC probe to pin 2 (grid) of picture tube.	A9	Adjust for MINIMUM deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT

Remove bias supply.
Tune in a TV station and adjust A9 for MINIMUM 4.5MC beat interference in the picture.

SOUND IF ALIGNMENT

Turn the set on and tune in a TV station. Reduce the signal input by use of an attenuator or similar device until hiss and background noise is noticed.
Adjust A10, A11, A12, A13 and R10 for maximum undistorted sound and MINIMUM buzz.
If hiss disappears during alignment, reduce signal until hiss reappears.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the unground side of C32. Connect the positive lead to chassis.
The channel oscillator adjustment screws are reached through a hole below and slightly to the right of the channel switch shaft. The correct adjustment screw is accessible though this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across VHF antenna leads with 120Ω in each lead.	213MC (10MC Swp.)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp.)	205.25MC 209.75MC	12		A15	
			201MC (10MC Swp.)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp.)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp.)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp.)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp.)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp.)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp.)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp.)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp.)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp.)	55.25MC 59.75MC	2		A25	

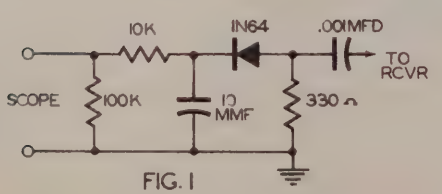


FIG. 1

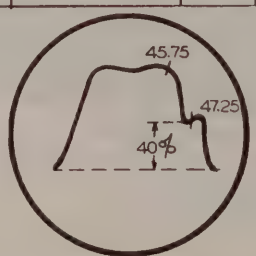


FIG. 2

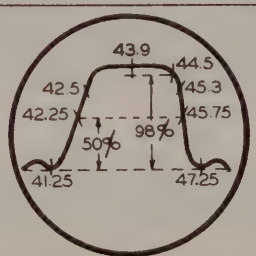


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C25. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A26, A27, A28	Adjust for response curve similar to Fig. 5 with markers above 90%.
10.	"	"	213MC (10MC Swp.)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel, make compromise adjustment of A26, A27, and A28 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp.)	199.25MC 203.75MC	11			
			195MC (10MC Swp.)	193.25MC 197.75MC	10			
			189MC (10MC Swp.)	187.25MC 191.75MC	9			
			183MC (10MC Swp.)	181.25MC 185.75MC	8			
			177MC (10MC Swp.)	175.25MC 179.75MC	7			
			85MC (10MC Swp.)	83.25MC 87.75MC	6			
			79MC (10MC Swp.)	77.25MC 81.75MC	5			
			69MC (10MC Swp.)	67.25MC 71.75MC	4			
			63MC (10MC Swp.)	61.25MC 65.75MC	3			
			57MC (10MC Swp.)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

The UHF tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

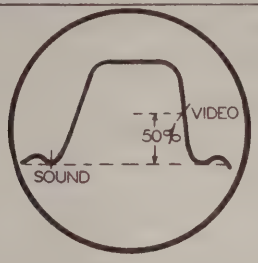


FIG. 4

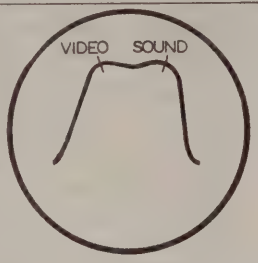
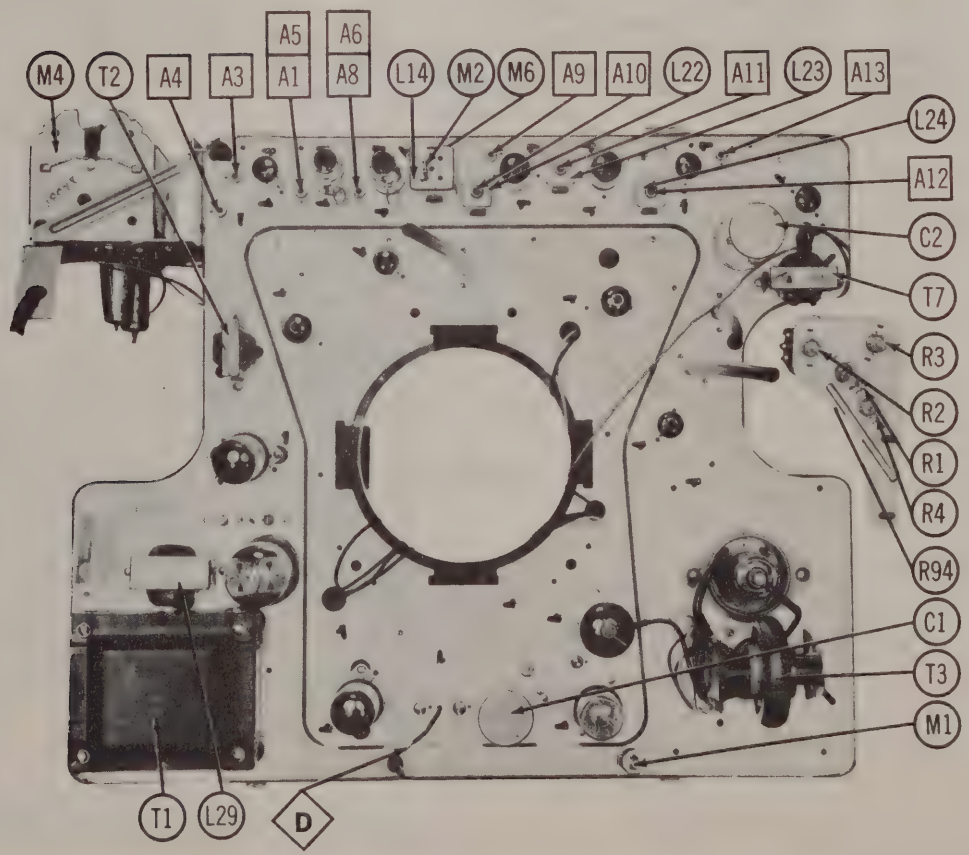


FIG. 5

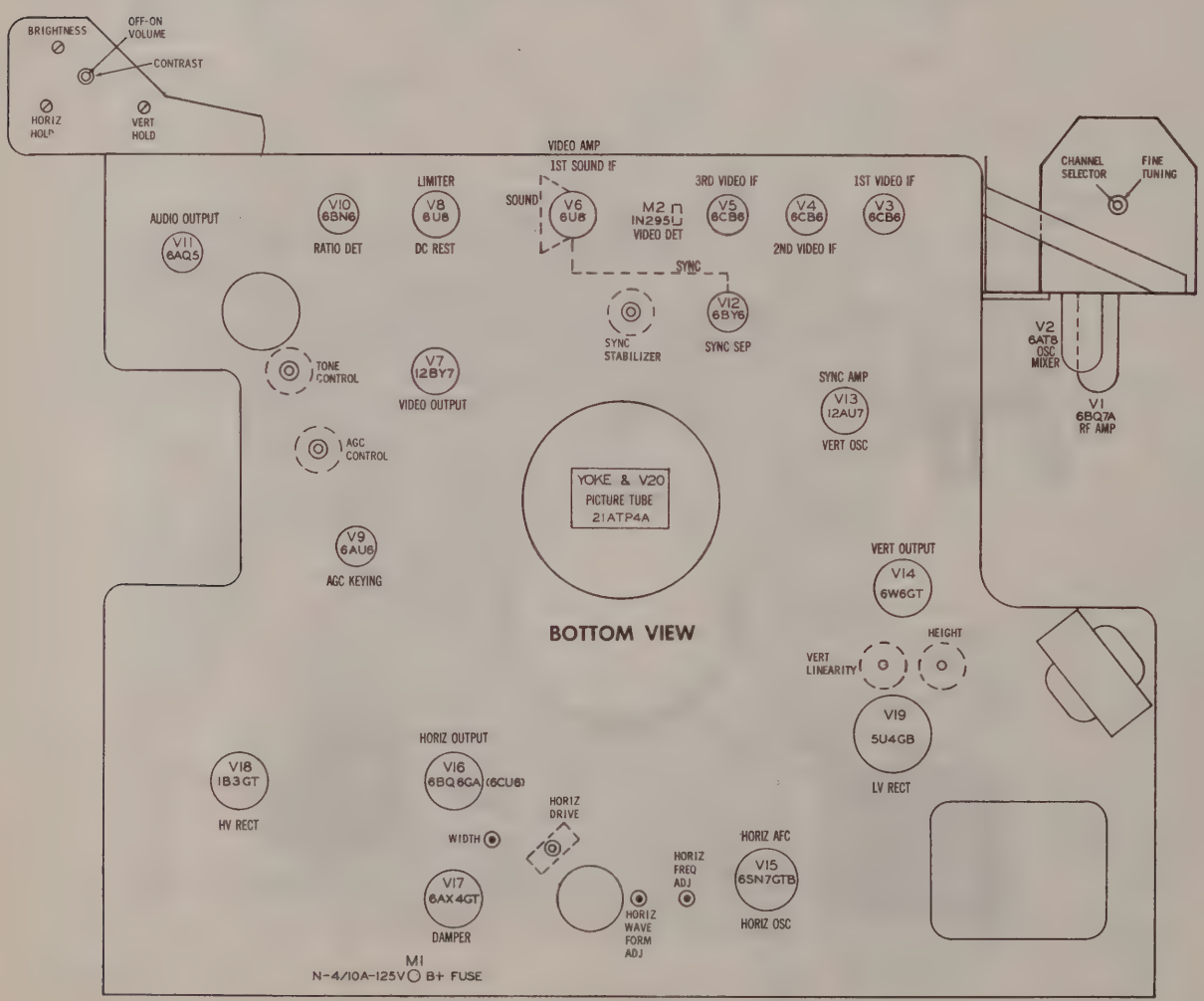


CHASSIS TOP VIEW

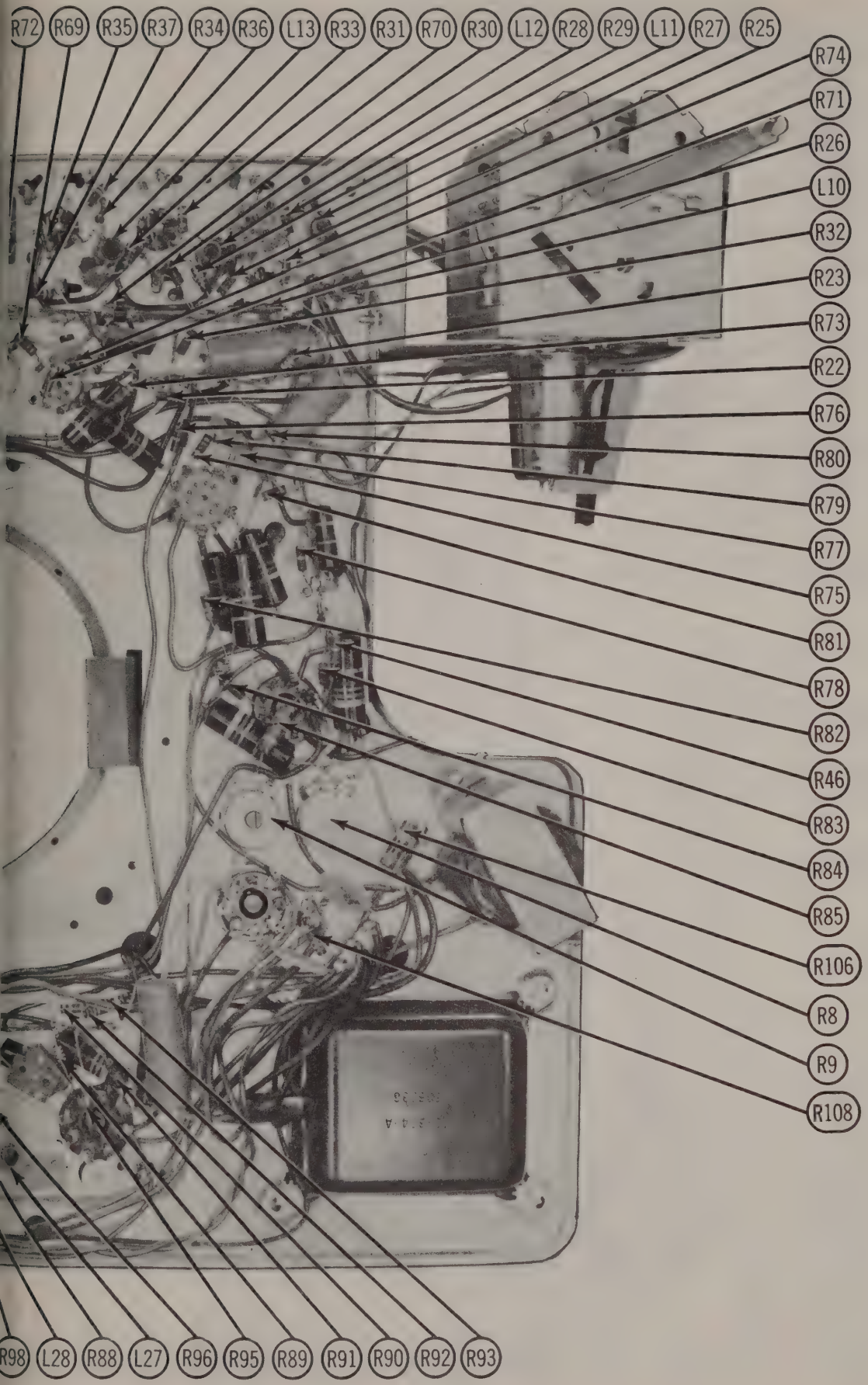
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	550KΩ	0Ω	0Ω	.1Ω	† 1.5KΩ	300KΩ	INF	0Ω
V 2	6AT8	10KΩ	† 7.3KΩ	0Ω	0Ω	.1Ω	† 17KΩ	† 50KΩ	0Ω	220KΩ
V 3	6CB6	30KΩ	47Ω	0Ω	.1Ω	† 3.2KΩ	† 3.2KΩ	0Ω		
V 4	6CB6	22KΩ	47Ω	0Ω	.1Ω	† 3.2KΩ	† 3.2KΩ	0Ω		
V 5	6CB6	.2Ω	180Ω	0Ω	.1Ω	† 2.7KΩ	† 2.7KΩ	0Ω		
V 6	6U8	† 9KΩ	2.1Ω	† 35KΩ	0Ω	.1Ω	† 35KΩ	560Ω	1.6Ω	3.9KΩ
V 7	12BY7	400Ω	1Meg	0Ω	0Ω	0Ω	.1Ω	† 3.6KΩ	† 1.7KΩ	0Ω
V 8	6U8	0Ω	100KΩ	† 150KΩ	.1Ω	0Ω	† 85KΩ	0Ω	1Meg	0Ω
V 9	6AU6	† 35KΩ	† 1.7KΩ	0Ω	.1Ω	120KΩ	† 45Ω	† 1.7KΩ		
V 10	6BN6	300Ω	3.5Ω	.1Ω	0Ω	† 6.5KΩ	6Ω	† 330KΩ		
V 11	6AQ5	500KΩ	270Ω	.1Ω	0Ω	† 1KΩ	† 500Ω	500KΩ		
V 12	6BY6	50KΩ	0Ω	0Ω	.1Ω	† 820KΩ	† 30KΩ	2.2Meg		
V 13	12AU7	▲ 1.7Meg	2Meg	220Ω	.1Ω	.1Ω	† 13KΩ	47KΩ	0Ω	0Ω
V 14	6W6GT	TP	0Ω	† 450Ω	† 450Ω	2.2Meg	NC	.1Ω	1KΩ	
V 15	6SN7GTB	400KΩ	† 56KΩ	0Ω	1.5Meg	† 10KΩ	400KΩ	.1Ω	0Ω	
V 16	6BQ6GA	TP	0Ω	NC	† 6.8KΩ	470KΩ	NC	.1Ω	100Ω	TOP CAP ▲ 10Ω
V 17	6AX4GT	NC	NC	750KΩ	NC	† 45Ω	NC	.1Ω	0Ω	
V 18	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 335Ω
V 19	5U4GB	NC	30KΩ	NC	23Ω	NC	20Ω	NC	30KΩ	
V 20	21ATP4A	0Ω	1Meg	PIN 6 † 100KΩ	PIN 10 ▲ 420KΩ	PIN 11 † 250KΩ	PIN 12 .1Ω			

† MEASURED FROM PIN 2 OF V19.
▲ MEASURED FROM PIN 3 OF V17.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART



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L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-CAPA

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BQ7A	
V2	Mixer-Oscillator	6AT8	
V3	1st. Video IF Amplifier	6CB6	
V4	2nd. Video IF Amplifier	6CB6	
V5	3rd. Video IF Amplifier	6CB6	
V6	Video Amplifier-Sound IF Amplifier	6U8	
V7	Video Output	12BY7	
V8	DC Restorer-Limiter	6U8	
V9	AGC Keying	6AU6	

ITEM No.	USE	TYPE	NOTES
V10	Audio Detector	6BN6	
V11	Audio Output	6AQ5	
V12	Sync Separator	6BY6	
V13	Sync Amplifier-Vert. Osc.	12AU7	
V14	Vert. Output	6W6GT	
V15	Horiz. AFC-Horiz. Osc.	6SN7GTB	
V16	Horiz. Output	6BQ6GA	Note 1
V17	Damper	6AX4GT	
V18	HV Rectifier	1B3GT	
V19	LV Rectifier	5U4GB	

Note 1. A 6CU6 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	TRUETONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V20	21ATP4 ①	21ATP4 ①	21ATP4 ①	21ATP4/ 21ATP4A②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲80	300	45X428	AFH4-07	B068	FP235	TMD-79	D-390	R2203 *
B	■20	300			BR205	TC36	TD-25-50	FM-0525	
C	▲20	50							
C2A	▲80	300	45X429	AFH3-29-50	B081	FP229.4	TMD-33	D-175	R2204 *
B	■60	300			BR505	TC39	TD-50-50	FM-0550	
C	▲40	50							
C3	4	50	47X418	PRS150V4	BR550	TC30	TD-4-50	MMT-0505	TVA-1303
C4	4	50	47X418	PRS150V4	BR550	TC30	TD-4-50	MMT-0505	TVA-1303

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	120		13L8V121K		D6-121		811-121			
C6	5		13L8C050D	NP0-DI5	TCZ-5	Z011	NP0A-050	ZT-555	5TCCB-V47	
C7	6.8		13L8C6R81	NP0-DI6.8	TCZ-6.8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C8	6.8		13L8C6R81	NP0-DI6.8	TCZ-6.8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C9	3			NP0-DI3	TCZ-3R3	Z007	NP0A-030	ZT-553	5TCCB-V33	
C10	5-15		31B-901-02							
C11	800		13M-320EA-102ZC							
C12	2.2		13L8GP2R2C	NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C13	1000		13L8X102Z	BPD-001	DD-102	K069	811-102	DC-521	5HK-D1	
C14	.5-3		31B-902		829-3		3115-01-0R5	CT565A		
C15	800		13M-320EA-102ZC							
C16	800		13M-320EA-102ZC							
C17	.5-3		31B-902		829-3		3115-01-0R5	CT565A		
C18	60		13M-320Q-600J							
C19	1		13D-111-20	NP0-SI1	TCZ-1		NP0A-010		5TCCB-V1	
C20	10		13L8UA100D							
C21	10		13L8Q100A							
C22	1000		13L8X102Z	BPD-001	DD-102	K069	811-102	DC-521	5HK-D1	
C23	1000		13L8X102Z	BPD-001	DD-102	K069	811-102	DC-521	5HK-D1	
C24	800		13M-320EA-102ZC							
C25	.47	200	RCP10M2474M	P288N-47		CUB2P47		PT4047	2TM-P47	
C26	47			NP0-SI47	TCZ-47	TZ22	831-470	ZT-5447	MS-447	
C27	47			NP0-SI47	TCZ-47	TZ22	831-470	ZT-5447	MS-447	
C28	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C29	680			BPD-00068	DD-681	K065	811-681	UC-5368	5GA-T68	
C30	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	56			NP0-SI56	TCZ-56	TZ24	NP0-337-560			
C32	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	.47	200	RCP10M2474M	P288N-47		CUB2P47		PT4047	2TM-P47	
C34	680			BPD-00068	DD-681	K065	811-681	UC-5368	5GA-T68	
C35	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	68			NP0-SI68	TCZ-68	TZ26	NP0-337-680		5TCC-Q68	
C37	560		80X9	1464-00056	D6-681	1R5T56	NP0-337-680		MS-356	
C38	470		80X4	1464-00047	DD-471	5R5T47	811-471	UC-5347	1FM-347	
C39	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C41	100			NP0-SI100	TCZ-100	TZ30	801-101	ZT-531	5TCC-T1	
C42	.047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C43	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C44	.015	600	RCP10M6153M	P688N-15	DD16-153	CUB6S15		PT6115	6TM-S15	
C45	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C46	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C47	1000		47X753	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	1.5			NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C49	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C51	100			NP0-SI100	D6-101	TZ30	801-101	ZT-531	5TCC-T1	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52A	1000		80X3	BPD-2X001	DD2-102	DK069	812-001	DCD521	5HK-2D1	
B	1000									
C53A	1000		80X3	BPD-2X001	DD2-102	DK069	812-001	DCD521	5HK-2D1	
B	1000									
C54	15									
C55	470		80X4	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C56	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C57	.0047	400	RCP10M4472M	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C58	.022	600	RCP10M6223M	BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C59	330	500	47X570	1469-00033		5R5T33			MS-333	
C60	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C61	.047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C62	.047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C63A	2000							DC-522		
B	5000		†76X7	†PA110	†PC-100	†115TM1	†1405-01	DC-525	†V1	
C	5000							DC-525		
C64	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C65	.022	200	RCP10M2223M	BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C66	.047	600	RCP10M6473M	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C67	.047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C68	.047	200	RCP10M2473M	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C69	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C70	18	500	RCM20B180K	1469-000018	TCZ-18	22R5Q18	NP0K-180		MS-418	
C71	82	500	RCM20K820K	1469-000082	TCZ-82	22R5Q82	NP0-337-820		MS-482	
C72	100	500		1469-0001	TCZ-100	22R5T1	NP0-337-101	MCB235	MS-31	
C73	.047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C74	.047	200	RCP10M2473M	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C75	.022	200	RCP10M2223M	BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C76	.47	200	RCP10M2474M	P288N-47		CUB2P47		PT4147	2TM-P47	
C77	220	500		1469-00022	TCZ-220	22R5T22	NP0-335-221		MS-322	
C78	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C79	820	500	RCM25B821K	1464-00082		1R5T82			MS-382	
C80	680			1464-00068	DD-681	K065	811-681	UC-5368	MS-368	
C81	.047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C82	39	5000	47X756		DD60-390					
C83	.1	600		P688N-1	DF-104	CUB6S1		PT601	6TM-P1	
C84	.15	200	RCP10M2154M	P288N-15		CUB2P15		PT4015	2TM-P15	
C85	10000		47X615	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C86	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C87	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	Note 1

† Items C63A, C73B, C63C, R77A, R77B and R77C are combined in one unit.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	B78X24A	F1-4	RTV-579	* QJ-873	UF13L	Contrast (Panel)
B	1Meg	½		R2-56			UR16-T35 †	Volume tapped at 500KΩ (Rear)
C	Switch			KB-2			US-27	Attach to R1B.
R2A	500KΩ	½	B40X394C	AB-59	A47-500K-S	Q11-133	U-50	Brightness
B	Shaft		Not Req.	AK-8	RS-3/16	NQ	DS-37	Attach to R2A.
R3A	1. 5Meg	½	B40X396C	AB-742	A47-1.5Meg-S	Q11-138	U-155	Vert. Hold
B	Shaft		Not Req.	AK-8	RS-3/16	NQ	DS-37	Attach to R3A.
R4A	50KΩ	½	B40X395C	AB-31	A47-50K-S	Q11-123	U-35	Horizontal Hold
B	Shaft		Not Req.	AK-8	RS-3/16	NQ	DS-37	Attach to R4A.
R5A	100KΩ	½	B40X407	AB-40	A47-100K-S	Q11-128	TA15L	Tone
B	Shaft		Not Req.	AK-4	FKS-½	Not Req.	Not Req.	Attach to R5A.
R6A	2. 5Meg	½	♦ B40X405	AB-83	A47-2.5Meg-S	Q11-239	TA255L	AGC-Note 1
B	Shaft		Not Req.	AK-19	RN-3	Not Req.	Not Req.	Attach to R6A.
R7A	7. 5Meg	½	■ B40X406	AB-89	A47-7.5Meg-S	Q11-142	PTA855L	Sync Stability-Note 2
B	Shaft		Not Req.	AK-19	RN-3	Not Req.	Not Req.	Attach to R7A.
R8A	2. 5Meg	½	B40X405A	AB-83	A47-2.5Meg-S	Q11-239	TA255L	Height
B	Shaft		Not Req.	AK-4	FKS-½	RQ	Not Req.	Attach to R8A.
R9A	1500Ω	½	B40X410	AB-6	A47-1500-S	Q11-109	PTA152L	Vert. Linearity
B	Shaft		Not Req.	AK-18	RN-3	RQ	Not Req.	Attach to R9A.
R10	500Ω	2	40X397		39-500			Buzz-Wire Wound

Note 1. Later production receivers will use an alternate control Part No. 40X412 in this application.
Note 2. Later production receivers will use an alternate control Part No. 40X405 in this application.
† Universal Replacement (Mallory Exact Duplicate Part No. UE71S).
♦ Versions using control Part No. 40X412 for replacement remove the 3. 9 megohm resistor connected from high side to arm of control.
■ Versions using control Part No. 40X405 for replacement remove the 3. 9 megohm resistor (R109) used with the old control.
* Concentrikit Equivalent: K-2 Kit, Base Elements and Shafts; B11-108 & P6-200 (Panel)
B13-137 X & R1-218 (Rear)
76-2 (Switch)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R11	680KΩ	½	12TAE684M	BTS-680K	
R12	4700Ω	½	12TAE472K	BTS-4700	
R13	820KΩ	½	12TAE824K	BTS-820K	
R14	470KΩ	½	12TAE474K	BTS-470K	
R15	220KΩ	½	12TAE224M	BTS-220K	
R16	8200Ω	½			
R17	10KΩ	½	12TAE103K		
R18	5600Ω	½	12TAE562K		
R19	15KΩ	½	12TAE153K		
R20	47KΩ	½	12TAE473K		
R21	1500Ω	2		BTB-1500	
R22	6800Ω	½		BTS-6800	
R23	390KΩ	½		BTS-390K	
R24	820KΩ	½		BTS-820K	
R25	4700Ω	½			
R26	1000Ω	½		BTS-1000	
R27	1000Ω	½		BTS-1000	
R28	47Ω 5%	½		BTS-47	
R29	68KΩ	½			
R30	1000Ω	½		BTS-1000	
R31	47Ω 5%	½		BTS-47	
R32	470Ω	½		BTS-470	
R33	47KΩ	½			
R34	22KΩ	½			
R35	1000Ω	½		BTS-1000	
R36	180Ω	½		BTS-180	
R37	3900Ω 5%	1		BTS-3900	
R38	5600Ω	1		BTA-5600	
R39	680Ω	½		BTS-680	
R40	820Ω	½		BTS-820	
R41	1Meg	½		BTS-1Meg	
R42	3600Ω	4	43X331		

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R43	68Ω	½		BTS-68	
R44	1Meg	½		BTS-1Meg	
R45	100KΩ	½		BTS-100K	
R46	2200Ω	½		BTS-2200	
R47	100KΩ	½		BTS-100K	
R48	22KΩ	½		BTS-22K	
R49	100KΩ	½		BTS-100K	
R50	33KΩ	½		BTS-33K	
R51	47KΩ	½		BTS-47K	
R52	68KΩ	½		BTS-68K	
R53	22KΩ	½		BTS-22K	
R54	100KΩ	½		BTS-100K	
R55	47KΩ	½		BTS-47K	
R56	47KΩ	½		BTS-47K	
R57	33KΩ	½		BTS-33K	
R58	560Ω	½		BTS-560	
R59	100KΩ	½		BTS-100K	
R60	82KΩ	½		BTS-82K	
R61	68KΩ	½		BTS-68K	
R62	680Ω	½		BTS-680	
R63	330KΩ	½		BTS-330K	
R64	4700Ω	½		BTS-4700	
R65	120KΩ	½		BTS-120K	
R66	470Ω	1		BTA-470	
R67	270Ω	1		BTA-270	
R68	10KΩ	½		BTS-10K	
R69	47KΩ	½		BTS-47K	
R70	150KΩ	½		BTS-150K	
R71	2. 2Meg	½		BTS-2. 2Meg	
R72	270KΩ	½		BTS-270K	
R73	820KΩ	½		BTS-820K	
R74	27KΩ	1		BTA-27K	

PARTS LIST AND D
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ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NO
R75	47KΩ	½		BTS-47K	
R76	4700Ω	½		BTS-4700	
R77A	22KΩ			BTS-22K	
B	8200		† 76X7	BTS-8200	
C	8200			BTS-8200	
R78	1. 2Meg	½		BTS-1. 2Meg	
R79	180KΩ	½		BTS-180K	
R80	2. 2Meg	½		BTS-2. 2Meg	
R81	1Meg	½		BTS-1Meg	Not
R82	22KΩ	½		BTS-22K	
R83	8200Ω	½		BTS-8200	Not
R84	2. 2Meg	½		BTS-2. 2Meg	
R85	680Ω	1		BTA-680	
R86	560Ω	½			
R87	560Ω	½			
R88	220KΩ	½			
R89	330KΩ	½			
R90	820KΩ	½			
R91	82KΩ	½			
R92	330KΩ	½			

Note 1. Some versions use a 470
Note 2. Some versions use a 12
Note 3. Used only with Sync sta
Note 4. Not used in some versic
† Items R77A, R77B, R77C, C63A

TRANSFO

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	TRUET PART
T1	117VAC ⓖ L 7A	525VCT ⓖ .270A	5V ⓖ 3A	6. 3V ⓖ 9. 6A	53X354

① Parallel and phase 6. 3V ⓖ 6A windings, tape 6. 3V ⓖ
② Tape high HV winding, tape 5V ⓖ 3A winding. Paral
③ Parallel and phase 6. 3V windings.

TRANSFORMER

ITEM No.	USE	TRUETONE PART No.	Halldorson PART No.	PA
T2	Vert. Osc. Trans.	54X10	B6702	A-3
T3	Horiz. Output Trans.	53X355	FB419 & RF800 * ①	HV MW
T4	Vert. Output Trans.	51X173	Z1900 ② ③	A-2
T5A	Yoke(90°)Horiz.(19MH)	9A2385-1 ④	DF607 ⑦	MD
B	Vert.(39MH)	9A2385 ④ ⑤ 2A435 ⑥	⑧	
T6	Width Coil (1-9MH)	9A2381	RF802 ⑨	MW

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Connect as auto transformer.
④ Includes resistors R86 and R87.
⑤ Alternate Airline part number.
⑥ Yoke rear cover and centering device.
⑦ Use original rear cover and centering device.
⑧ Use original horizontal yoke damping network.
⑨ Do not use tap.
⑩ Connect to coded red and blue terminals.

*HORIZONTAL OUTPUT
Use Original Width C

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Re Co
	8	9	9	
	4	7	7	
	3	7	7	
	2	4-Also See Note ⑪	4-Also See Note ⑪	4-
	1	3	3	
	5	1	1	
Connect Width Coil Across →	1 & 5	Terms. #1 & #2 of RF800 Across 3 & 1	MWC-11 Across 3 & 1	2 A 3
Special Notes →		⑪ ⑫	⑪ ⑫	

⑪ Connect approximately 100-150MMF ⓖ 2KV in se #3 and #7.
⑫ Change values of resistors R55 and R56 as neces Keying tube.
⑬ Ground either terminal #6 or terminal #7.

TRANSFORMER

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.
T7	4.7KΩ	3-4Ω	51X176	Z1005	A2930

SP

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	TRUETONE PART No.	QUA PART
SP1	10"	PM	3-4Ω	12A533	10A3
	6"	PM	3-4Ω	12A528 ①	6A1
SP2	4"	PM	3-4Ω	12A532	4A07

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	TRUETONE PART No.	REPLACEMENT DATA: ABBOVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52A	1000			80X3	BPD-2X001	DD3-102	DX069	812-001	DCD521	5HK-2D1
B	1000									
C53A	1000			80X3	BPD-2X001	DD3-102	DX069	812-001	DCD521	5HK-2D1
B	1000									
C54	15									
C55	470			80X4	BPD-00047	DD-471	K069	811-471	UC-5347	5GA-747
C56	5000				BPD-005	DD-502	K099	811-006	UC-5351	5HK-D5
C57	.0047	600	RCP10M4473M	BPD-0047	DF-503	CUBED47	GP3-333-47S	PT2347	6TM-D47	
C58	.033	600	RCP10M3233M	BPD-03	DF-303	CUBED33	817-03	PT7133	6TM-033	
C59	330	500	47X370	1469-00033						
C60	5000			BPD-005	DD-502	K085	811-005	DC-5351	5HK-D5	
C61	.047	400	RCP10M4473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C62	.047	600	RCP10M4473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C63A	2000							DC-533		
B	5000		†T6X7	†PA110	†PC-100	†10TM2	†140B-01	DC-536	†V1	
C	5000							DC-536		
C64	.01	600		BPD-01	D6-103	CUBED1	GP3-333-103	PT7111	6TM-01	
C65	.033	300	RCP10M3233M	BPD-03	DF-303	CUBED33	817-03	PT7133	6TM-033	
C66	.047	600	RCP10M5473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C67	.047	600	RCP10M4473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C68	.047	300	RCP10M3473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C69	.1	400		P68BN-1	DF-104	CUBEP1		PT701	4TM-P1	
C70	18	500	RCM20B180K	1469-00001S	TCE-18	32B18Q3	NPOK-180		MS-418	
C71	82	500	RCM20E820K	1469-00008S	TCE-82	32B18Q3	NPO-337-820		MS-482	
C72	100	500		1469-0001	TCE-100	32B5Y1	NPO-337-101	MC-B535	MS-31	
C73	.047	600	RCP10M4473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C74	.047	300	RCP10M2473M	BPD-05	DF-503	CUBED47		PT7147	2TM-047	
C75	.033	300	RCP10M2233M	BPD-03	DF-303	CUBED33	817-03	PT7133	2TM-033	
C76	.47	300	RCP10M2474M	P268N-47		CUBEP47		PT7147	2TM-P47	
C77	220	500		1469-00022	TCE-220	32B5T23	NPO-335-221		MS-322	
C78	.01	400		BPD-01	D6-103	CUBED1	GP3-333-103	PT7111	6TM-01	
C79	820	500	RCM35B821K	1464-00063		1B5T23			MS-382	
C80	680			1464-00068	DD-681	K065	811-681	UC-5355	MS-368	
C81	.047	400	RCP10M4473M	BPD-05	DF-503	CUBED47		PT7147	6TM-047	
C82	39	5000	47X756		DD80-390					
C83	.1	600		P68BN-1	DF-104	CUBEP1		PT701	6TM-P1	
C84	.15	200	RCP10M1534M	P388N-15		CUB2P15		PT7015	2TM-P15	
C85	10000		47X515	BPD-01	DD-103	K092	811-01	DC-511	5HK-S1	
C86	10000			BPD-01	DD-103	K065	811-01	DC-511	5HK-S1	
C87	.1	600		P68BN-1	DF-104	CUBEP1		PT701	6TM-P1	Note 1

† Items C63A, C73B, C63C, R77A, R77B and R77C are combined in one unit.
Note 1. Not used in some versions.

CONTROLS

ITEM No	RESIST	WATTS	TRUETONE PART No.	REPLACEMENT DATA: CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω		B76X24A	F1-6	RTV-578	* QJ-373	UF15L	Contrast (Panel)
B	1Meg			R2-56			UR16-735	Volume Input at 500KΩ (Rear)
C	Switch			KS-5			US-37	Attach to R1B.
R2A	500KΩ		B40X396C	AB-59	A47-500K-B	QJ-133	U-50	Brightness
B	Shaft		Not Req.	AK-8	RS-3A6	NQ	D6-37	Attach to R2A.
R3A	1.5Meg		B40X395C	AB-742	A47-1.5Meg-B	QJ-138	U-125	Vert. Hold
B	Shaft		Not Req.	AK-8	RS-3A6	NQ	D6-37	Attach to R3A.
R4A	50KΩ		B40X395C	AB-31	A47-50K-B	QJ-133	U-35	Horizontal Hold
B	Shaft		Not Req.	AK-8	RS-3A6	NQ	D6-37	Attach to R4A.
R5A	100KΩ		B40X407	AB-40	A47-100K-B	QJ-138	Y-one	Tone
B	Shaft		Not Req.	AK-4	FKB-1	Not Req.	Not Req.	Attach to R5A.
R6A	2.5Meg		▪ B40X405	AB-83	A47-2.5Meg-B	QJ-139	TA3S5L	AGC-Note 1
B	Shaft		Not Req.	AK-19	RK-3	Not Req.	Not Req.	Attach to R6A.
R7A	7.5Meg		▪ B40X405	AB-89	A47-7.5Meg-B	QJ-143	PTA856L	Sync Stability-Note 2
B	Shaft		Not Req.	AK-19	RK-3	Not Req.	PTA13L	Attach to R7A.
R8A	2.5MEG		B40X405A	AB-83	A47-2.5Meg-B	QJ-139	TA3S5L	Height
B	Shaft		Not Req.	AK-4	FKB-1	Not Req.	Not Req.	Attach to R8A.
R9A	150Ω		B40X410	AB-6	A47-150-B	QJ-109	PTA13L	Vert. Linearity
B	Shaft		Not Req.	AK-19	RK-3	Not Req.	Not Req.	Attach to R9A.
R10	500Ω	2	40X397		39-500			Buzz-Wire Wound

Note 1. Later production receivers will use an alternate control Part No. 40X412 in this application.
Note 2. Later production receivers will use an alternate control Part No. 40X405 in this application.
† Universal Replacement (Mallory Exact Duplicate Part No. UE76).
▪ Versions using control Part No. 40X412 for replacement remove the 3.9 megohm resistor connected from high side to arm of control.
● Versions using control Part No. 40X405 for replacement remove the 3.9 megohm resistor (R109) used with the old control.
• Concentrikit Equivalent: K-3 Kit, Base Elements and Shafts; B11-108 & P6-200 (Panel)
B13-137 X & R1-316 (Rear)
76-3 (Switch)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R11	680KΩ	½	12TAE684M	BTS-680K	
R12	470KΩ	½	12TAE473K	BTS-470K	
R13	330KΩ	½	12TAE334K	BTS-330K	
R14	470KΩ	½	12TAE474K	BTS-470K	
R15	330KΩ	½	12TAE334M	BTS-330K	
R16	9300Ω	½			
R17	10KΩ	½	12TAE103K		
R18	5600Ω	½	12TAE563K		
R19	18KΩ	½	12TAE183K		
R20	47KΩ	½	12TAE473K		
R21	1900Ω	½		BTS-1900	
R22	680Ω	½		BTS-680Ω	
R23	390KΩ	½		BTS-390K	
R24	820KΩ	½		BTS-820K	
R25	470Ω	½			
R26	1000Ω	½		BTS-1000	
R27	1000Ω	½		BTS-1000	
R28	470 5%	½		BTS-47	
R29	68KΩ	½			
R30	1000Ω	½		BTS-1000	
R31	470 5%	½		BTS-47	
R32	470Ω	½		BTS-470	
R33	47KΩ	½			
R34	22KΩ	½			
R35	1000Ω	½		BTS-1000	
R36	180Ω	½		BTS-180	
R37	3900Ω 5%	½		BTS-3900	
R38	5600Ω	½		BTA-5600	
R39	680Ω	½		BTS-680	
R40	820Ω	½		BTS-820	
R41	1Meg	½		BTS-1Meg	
R42	3300Ω	½	43X331		

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R43	68Ω	½		BTS-68	
R44	1Meg	½		BTS-1Meg	
R45	100KΩ	½		BTS-100K	
R46	2200Ω	½		BTS-2200	
R47	100KΩ	½		BTS-100K	
R48	22KΩ	½		BTS-22K	
R49	100KΩ	½		BTS-100K	
R50	33KΩ	½		BTS-33K	
R51	47KΩ	½		BTS-47K	
R52	68KΩ	½		BTS-68K	
R53	22KΩ	½		BTS-22K	
R54	100KΩ	½		BTS-100K	
R55	47KΩ	½		BTS-47K	
R56	47KΩ	½		BTS-47K	
R57	33KΩ	½		BTS-33K	
R58	560Ω	½		BTS-560	
R59	100KΩ	½		BTS-100K	
R60	82KΩ	½		BTS-82K	
R61	68KΩ	½		BTS-68K	
R62	68KΩ	½		BTS-680	
R63	330KΩ	½		BTS-330K	
R64	470KΩ	½		BTS-470K	
R65	120KΩ	½		BTS-120K	
R66	47Ω	1		BTA-470	
R67	270Ω	1		BTA-270	
R68	10KΩ	½		BTS-10K	
R69	47KΩ	½		BTS-47K	
R70	150KΩ	½		BTS-150K	
R71	2.2Meg	½		BTS-2.2Meg	
R72	270KΩ	½		BTS-270K	
R73	330KΩ	½		BTS-330K	
R74	27KΩ	1		BTA-27K	

RESISTORS (cont)

ITEM No	RATING OHMS	RATING WATT	TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R75	47KΩ	½		BTS-47K	
R76	4700Ω	½		BTS-470Ω	
R77A	22KΩ	½	† T6X7	BTS-22K	
B	8200	½		BTS-8200	
C	8200	½		BTS-8200	
R78	1 2Meg	½		BTS-1.2Meg	
R79	180KΩ	½		BTS-180K	
R80	2 2Meg	½		BTS-2.2Meg	
R81	1Meg	½		BTS-1Meg	Note 1
R82	22KΩ	½		BTS-22K	
R83	8200Ω	½		BTS-8200	Note 2
R84	2 2Meg	½		BTS-2 2Meg	
R85	680Ω	½		BTA-680	
R86	560Ω	½			
R87	580Ω	½			
R88	220KΩ	½			
R89	330KΩ	½			
R90	820KΩ	½			
R91	82KΩ	½			
R92	330KΩ	½			

ITEM No	RATING OHMS	RATING WATT	TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R93	3900Ω	½			
R94	120KΩ	½			
R95	82KΩ	½			
R96	22KΩ	½			
R97	1Meg	½		BTS-1Meg	
R98	56KΩ	½		BTS-56K	
R99	68Ω	½			
R100	470KΩ	½			
R101	6800Ω	2			
R102	100Ω	2			
R103	470KΩ	½		BTS-470K	
R104	4700Ω	5			
R105	1700Ω	10	43X386	1 3/4A-1750	
R106	10Ω	1		BTA-10	
R107	100KΩ	2		BTS-100K	
R108	270KΩ	2		BTS-270K	
R109	3.9Meg	½		BTS-3.9Meg	Note 3
R110	68Ω	1		[illegible]	Note 4
R111	100Ω	1		[illegible]	Note 4

Note 1. Some versions use a 470KΩ 1W resistor in this application.
Note 2. Some versions use a 12KΩ 1W resistor in this application.
Note 3. Used only with sync stability control No. 40X405.
Note 4. Not used in some versions.
† Items R77A, R77B, R77C, C63A, C63B, C63C are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	TRUETONE PART No.	REPLACEMENT DATA: Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	525VCT;	5V	6.3V	53X354-A		P2830 ①	P6232 ②	25R32 ②	R-63BC ①
	1.7A	@ 270A	@ 2A	@ 6.0A						

① Parallel and phase 6.3V ③ 6A windings, tape 6.3V ⑤ 1.2A winding.
② Tape high HV winding, tape 5V ④ 3A winding. Parallel and phase 5.3V ④ 5A windings.
③ Parallel and phase 6.3V windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	Vert. Osc. Trans.	54X60	B6702	A-2003	209791	V405	A-8125	28A03	A-97X
T3	Horiz. Output Trans.	53X395	FB419 & RF800 *	HVO-16 & MWC-11 *	2387I & 2112R1	30364 & 201R15 *	A-8265 *	FLY-16 & WC-18 *	F-50 & WC-13 *
T4	Vert. Output Trans.	51X173	Z1900 ②	A-2823 ①		V302 ①	A-8142 ①	28S72 ①	A-108X ①
T5A	Yoke(90°)	9A2285-1 ④	DF807 ⑤	MDF-92 ⑤	2358DI ⑤	T90P19A3 ⑤	DY-16A ⑤	Y-16 ⑤	Y-41-1 ⑤
B	Horiz.(110°) Vert.(99°)	9A2355 ⑤ 2A455 ⑤							
T6	Width Coil (I-RMH)	9A2281	RF802 ⑤	MWC-6	21R1	201R15	WC-8	WC-22	WC-13 ⑩

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Connect as auto transformer.
④ Includes resistors R86 and R87.
⑤ Alternate Airline part number.
⑥ Yoke rear cover and centering device.
⑦ Use original rear cover and centering device.
⑧ Use original horizontal yoke damping network.
⑨ Do not use tap.
⑩ Connect to coded red and blue terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	9	9	9	9	8	9	9
4	7	7	7	7		7	7
3	7	7	7	7	7	7	7
2	4-Also See Note ⑪	4-Also See Note ⑪	4-Also See Note ⑪	"T"-Also See Note ⑪	3-Also See Note ⑪	"T"-Also See Note ⑪	4-Also See Note ⑪
1	3	3	3	3	3	3	3
5	1	1	1	1	4	1	1
Cement Width Coil Across	1 & 5	Terms. #1 & #2 of RF800 Across 3 & 1	MWC-11 Across 3 & 1	2112R1 Across 3 & 1	201R16 Across 3 & 1	6 & 7	WC-18 Across 3 & 1	Red & Blue Terms. of WC-13 Across 3 & 1
Special Notes	⑫ ⑬	⑫ ⑬	⑫ ⑬	⑫ ⑬	⑫ ⑬	⑫ ⑬	⑫ ⑬	⑫ ⑬

⑪ Connect approximately 100-150MMF @ 2KV in series with resistor R104, and connect across horizontal yoke terminals #3 and #7.
⑫ Change values of resistors R55 and R56 as necessary to obtain required peak to peak pulse voltage at plate of V8, AGC Keying tube.
⑬ Ground either terminal #6 or terminal #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	TRUETONE PART No	REPLACEMENT DATA: Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T7	4.7KΩ	3-4Ω	51X176	21005	A2930	A3877			

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	TRUETONE PART No.	REPLACEMENT DATA: QUAM PART No.	RCA TYPE No	NOTES
SP1	10"	PM	3-4Ω	12A333	10A5I	237S1	① Used in some versions.
SP2	6"	PM	3-4Ω	12A528	6A1	229S1	
	4"	PM	3-4Ω	12A532	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No	MILLER PART No.	NOTES
L1	Ant. Matching Trans	0Ω	0Ω	31TA-413				
L2	Ant. Matching Trans	0Ω	0Ω	31TA-413				
L3	FM Trap	0Ω		31T-417				
L4	IF Trap	.3Ω		31T-418-01				
L5A	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-302-D				Channel 3.
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-303-D				Channel 3.
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-304-D				Channel 4.
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-305-D				Channel 5.
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-306-D				Channel 6.
F	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-307-D				Channel 7.
G	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-308-D				Channel 8.
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-309-D				Channel 9.
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-310-D				Channel 10.
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-311-D				Channel 11.
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-312-D				Channel 12.
L	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-313-D				Channel 13.
L6	Plil. Choke	0Ω		34A-732				
L7	Neut. Coil	0Ω		31B-727				
L8	RF Coil	0Ω		35A-164-01				
L9	Conv. Plate	.1Ω		31UA-505				
L10	39MC Trap	0Ω		9A2389		TV-152	6235	
L11	1st. Video IF	.1Ω		9A2365		TV-131	6235	
L12	2nd. Video IF	.3Ω	.3Ω	9A2363			6232	Includes 47.25MC Trap.
L13	3rd. Video IF	.3Ω	.3Ω	9A2364			6231	Includes 41.25MC Trap.
L14	Series Peaking Coil	5.5Ω		9A2375	19-3036	TV-180	6176	30 Microhenries.
L15	Series Peaking Coil	9.5Ω		39A25	19-3095*	TV-181*	6177*	82 Microhenries; Wound On 3 XKO Resistor.
L16	Shunt Peaking Coil	20Ω		39A34	19-4400	TV-190	[illegible]	360 Microhenries.
L17	4.5MC Trap	1.8Ω		9A2382				
L18	Shunt Peaking Coil	10Ω		39A36	19-3100	TV-181	6177	100 Microhenries.
L19	Shunt Peaking Coil	11Ω		39A1	19-3100m	TV-181m	6177m	100 Microhenries; Wound On 2XKO Resistor.
L20	Series Peaking Coil	13.5Ω		39A12	19-4350	TV-184m	6180m	180 Microhenries; Wound On 22KΩ Resistor.
L21	Shunt Peaking Coil	18Ω		39A37	19-3250m	TV-185m	6181m	235 Microhenries; Wound 8.2KΩ Resistor.
L22	1st. Sound IF	2.1Ω		9A2383				
L23	2nd. Sound IF	2.5Ω	3.5Ω	9A2368	17-3495	TV-113	6203	
L24	3rd. Sound IF	2.5Ω	3.5Ω	9A2368	17-3495	TV-113	[illegible]	
L25	Quadrature Coil	6Ω		9A2367	20-1005		1480	
L26	RF Choke	1Ω		9A2380	19-1001		4604	1.5 Microhenries.

* Parallel with 5.9KΩ resistor.
▪ Parallel with 270Ω resistor.
• Parallel with 8.2KΩ resistor.
▲ Parallel with 22KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L27	78Ω		9A2372			6211†				Horiz. Osc Tapped @ 55Ω. Horiz. Waveform.
L28	80Ω		9A2371							

† Enlarge mtg. hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~/~)	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L29	.270A	41Ω	18H	52X95-4	C5037 ①	C2998 ①	C2328 ①	26C44 ①	C-23X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	TRUETONE PART No. FUSE	TRUETONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M1	N	4/10A 125V	16X162	16X163	333.400 (M 4/10A)	346009	N 4/10	HN 3/10-½

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

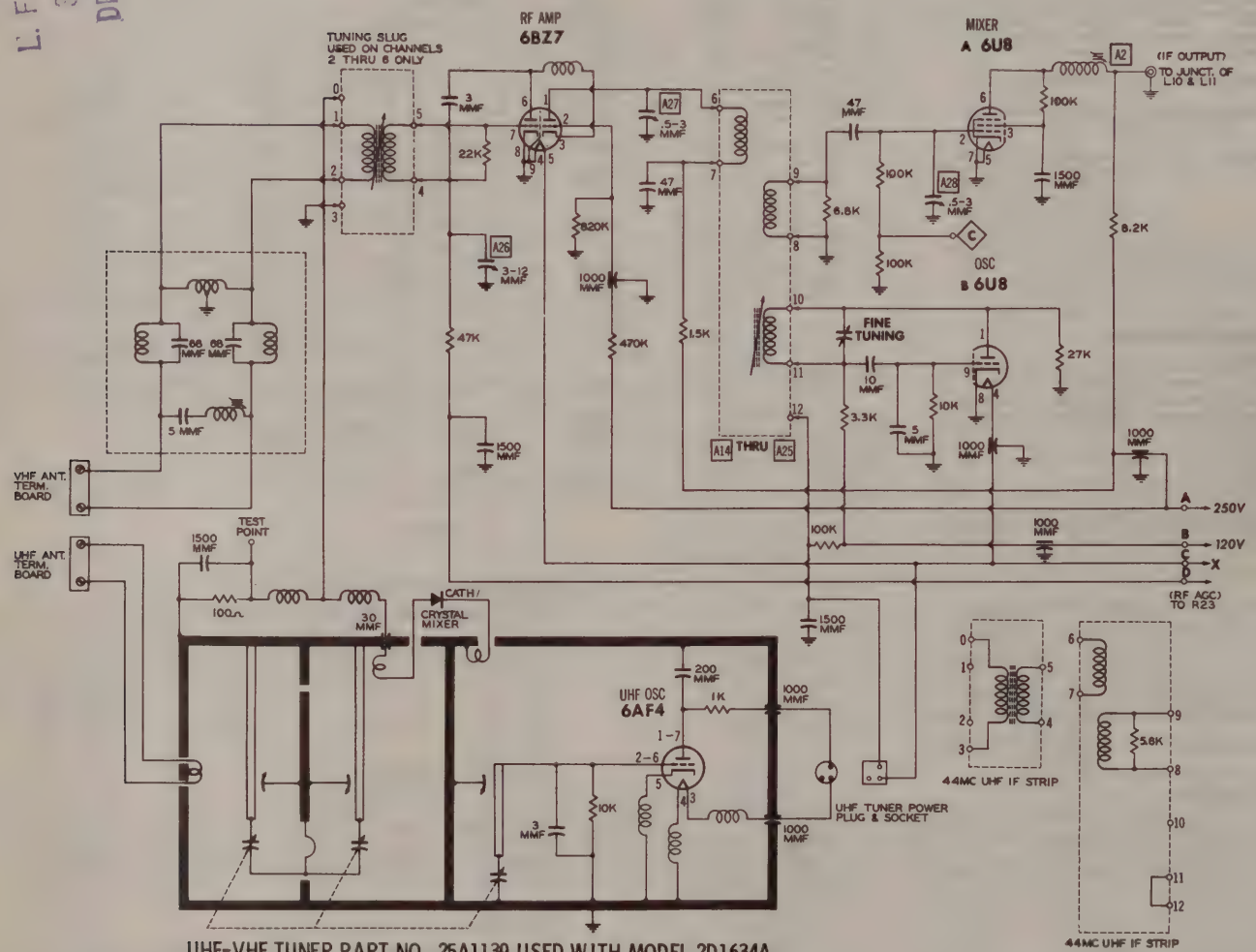
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		TRUETONE PART No.	SYLVANIA PART No.	
M2	1N295 *	17X190	1N60	Video Detector (Pigtail)

* Some versions may use crystal diode types CK706A or 1N60.

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial Light	7A103	#47
M4	Tuner	25A1137	VHF-Model 2D1636A, 2D2634A
M5	Tuner	25A1139	VHF-UHF Combination; Model 2D1634A
M6	Video Det. Assy.	9A2370	Includes M2, Coils and Capacitors
M7	Centering Magnet	2A435	Includes Deflection Yoke (T5) Rear Cover
M8	Ion Trap	2A421	
B3	Trimmer Cap.	17A271	Horizontal Drive (170-700MMF)
	Knob	S-38A69	Fine Tuning Assembly-VHF Models
	Knob	S-38A68	Channel Selector Assembly-VHF Models
	Knob	S-38A70	Contrast Assembly-UHF-VHF Models
	Knob	S-38A71	On-Off-Volume Assembly-UHF-VHF Models
	Knob	10A858-2	Fine Tuning Assembly (Mahogany Cabinets) UHF Models
	Knob	10A858-3	Fine Tuning Assembly (Blond Cabinets) UHF Models
	Knob	S-38A72	VHF Channel Selector Assembly -UHF Models
	Knob	S-38A73	UHF Channel Selector Assembly-UHF Models
	Knob	S-38A74	On-Off-Volume Assembly-UHF Models
	Knob	10A861-1	Secondary Controls (3 used)

PROPERTY OF
L. F. BLANKENSHIP
3321 MEADE ST.
DENVER, COLORADO



UHF-VHF TUNER PART NO. 25A1139 USED WITH MODEL 2D1634A.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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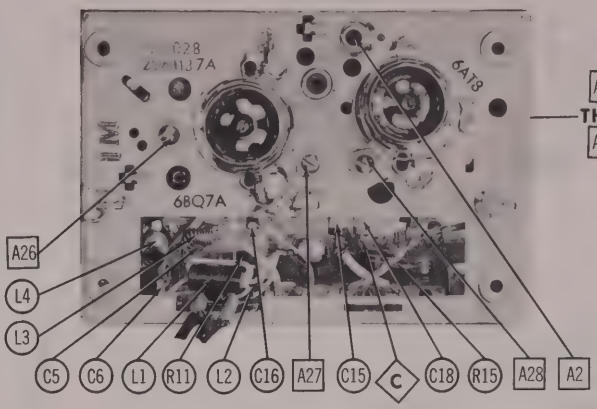
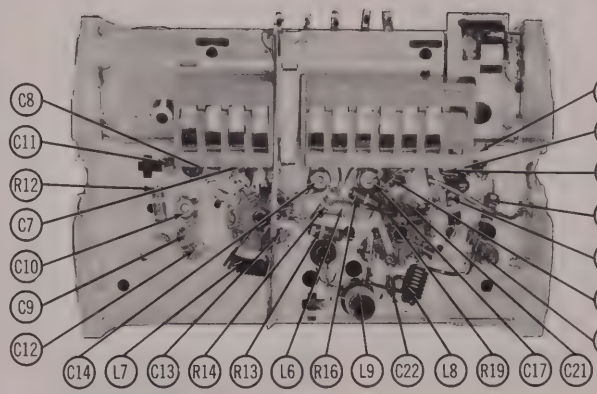
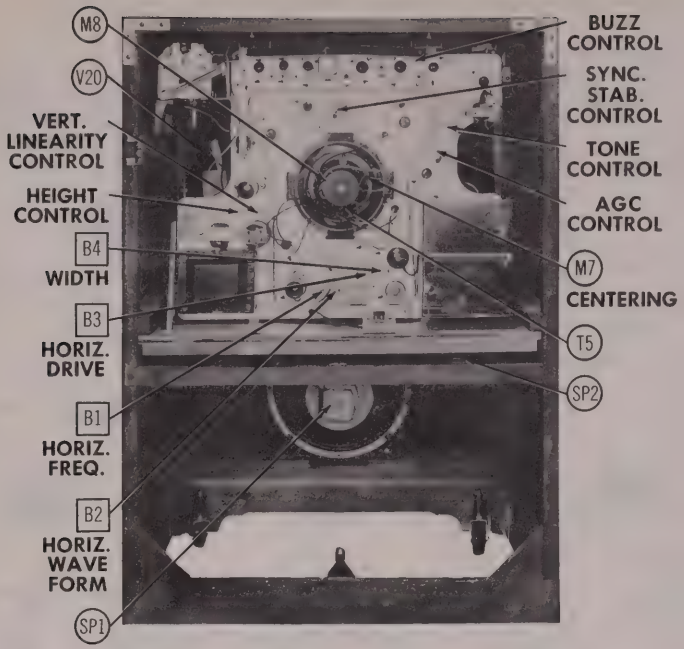
UHF VHF TUNER SCHEMATIC



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the contrast control for normal contrast.

1. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

2. Connect the vertical amplifier of an oscilloscope thru 10MMF to point (D). Connect the low side to chassis. Adjust the waveform slug (B2) until a waveform similar to Fig. 6 is obtained. While making this adjustment, keep the picture in sync with the horizontal hold control and if necessary, B1.

3. With picture in sync, turn contrast control fully counter clockwise and the brightness control clockwise so that the picture appears to be washed out. Turn the horizontal drive control (B3) clockwise until a white vertical line appears and then back slightly counter clockwise until the line disappears.

4. Adjust the width control (B4) until the picture just fills the picture mask horizontally. Reset contrast and brightness controls for normal picture.

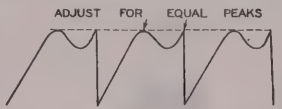
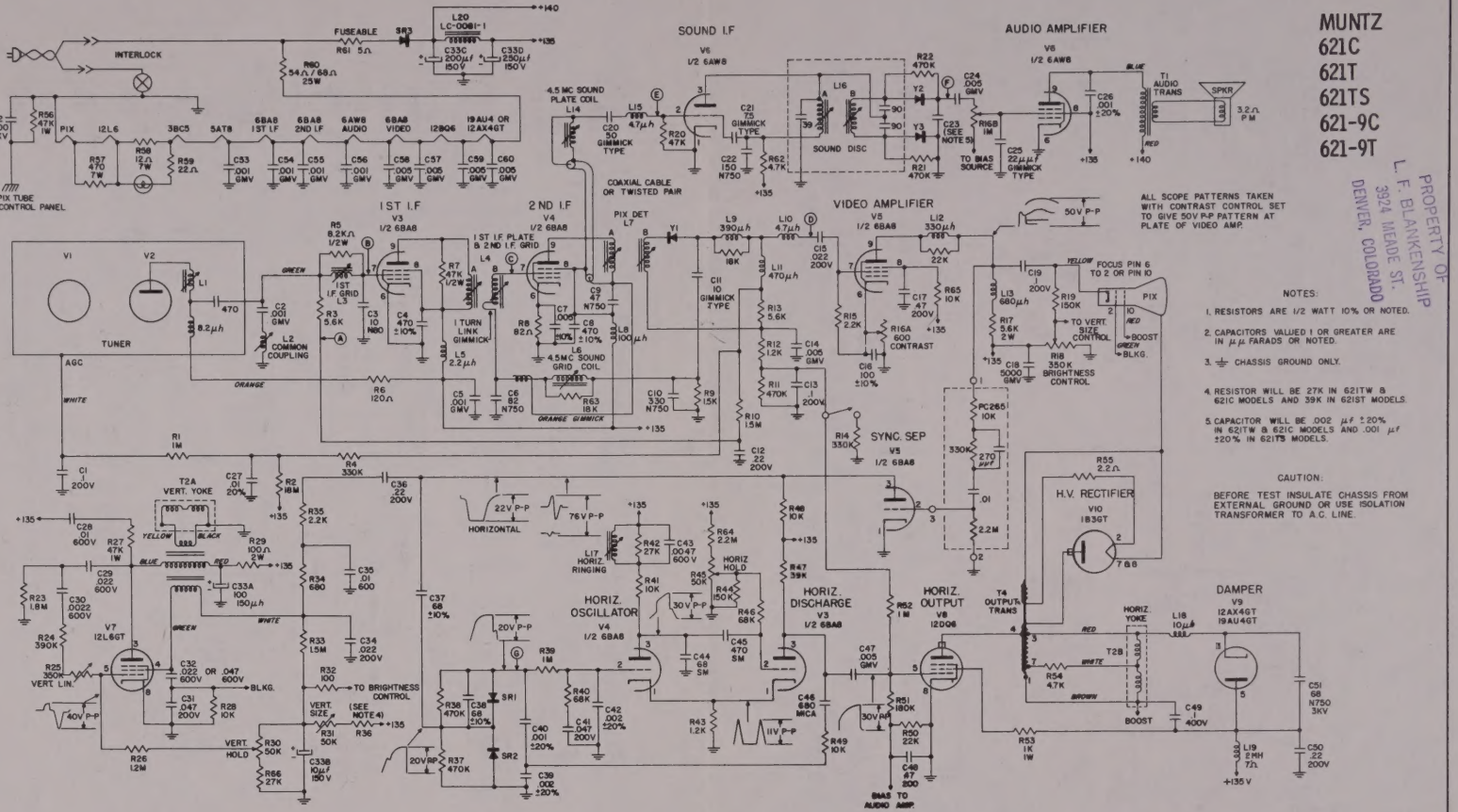


FIG. 6

L. E. ... ENSHIP
3 ... E ST.
DEN ..., COLORADO



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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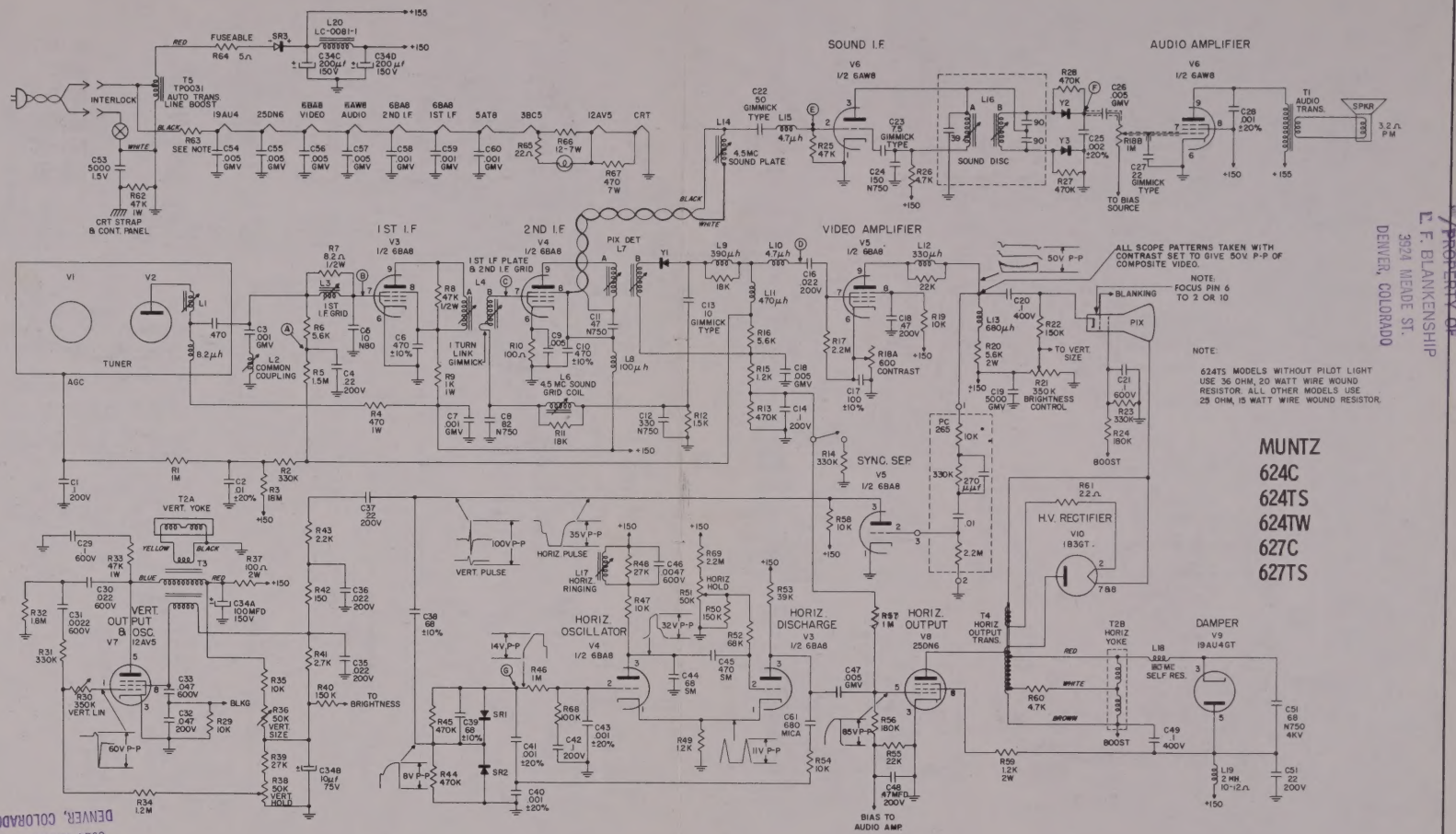

PROPERTY OF E. F. BLANKENSHIP 3924 MEADE ST. DENVER, COLORADO

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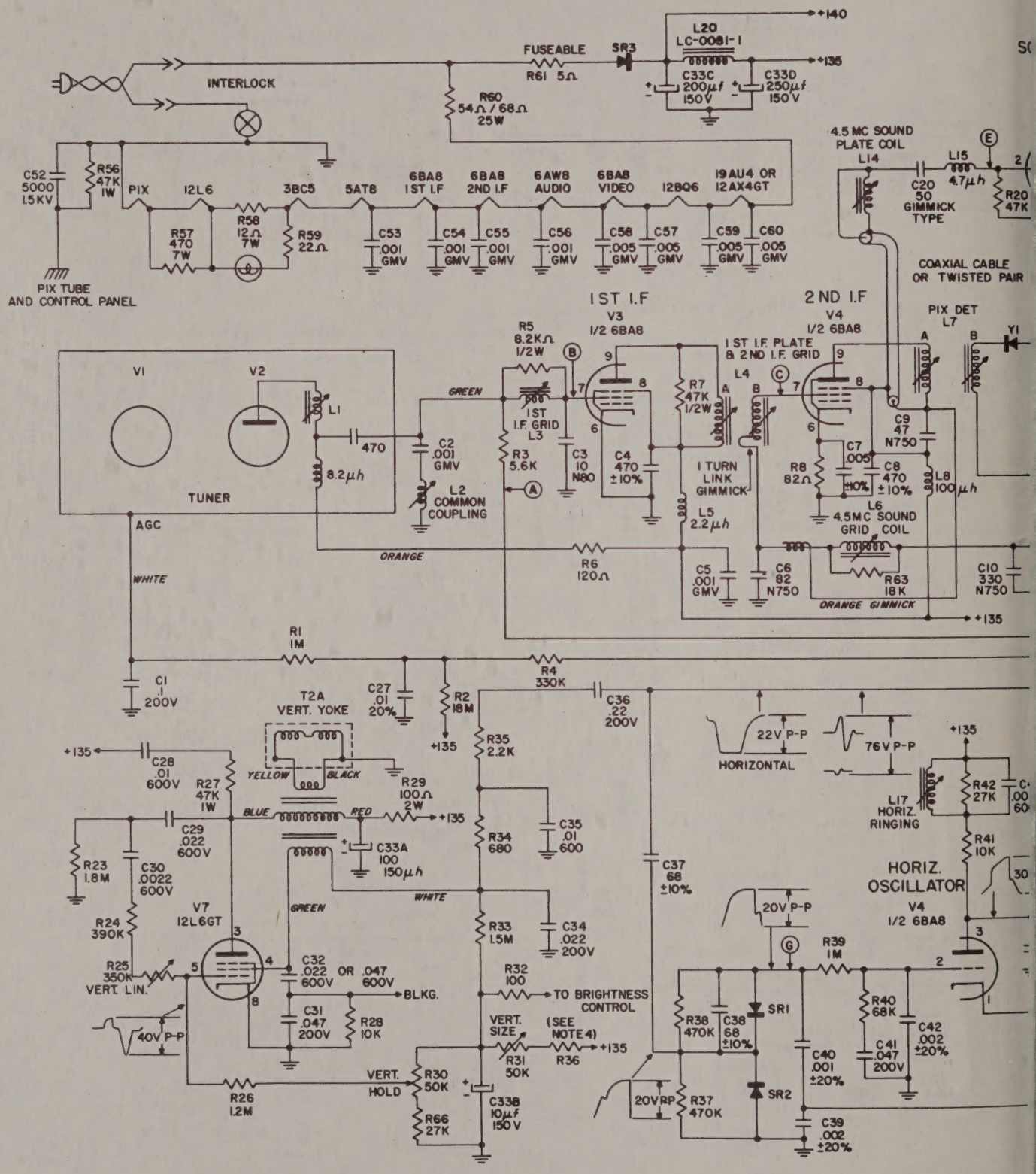
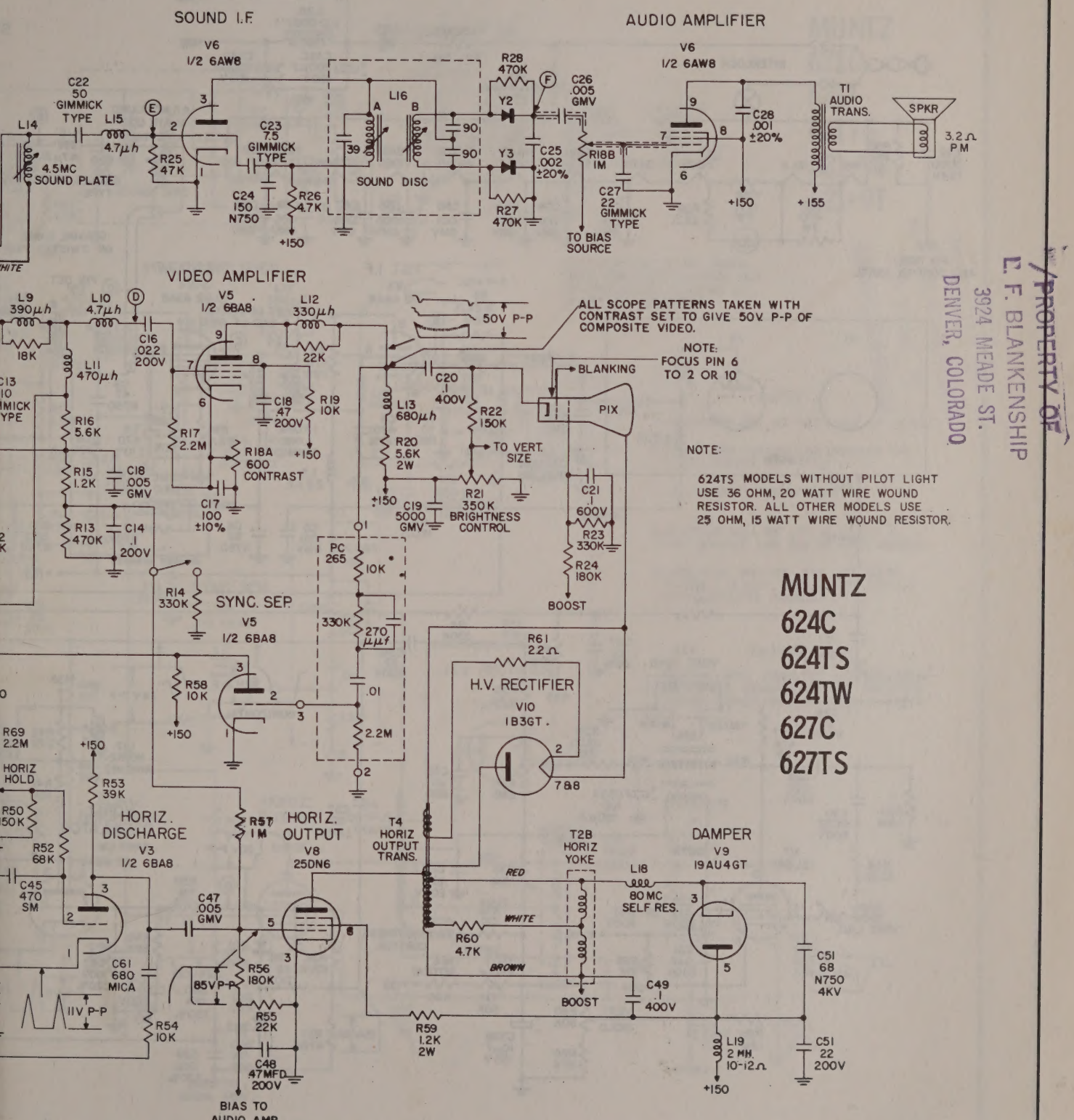


SCHEMATIC COURTE



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